

宇宙航空研究開発機構殿

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PALSAR 処理コア部ソフトウェアの評価・検証

プロダクトフォーマット説明書

PALSAR レベル 1.1/1.5 編

(英語版)

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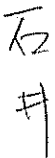
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| 承認                                                                                  | 点検                                                                                  | 作成                                                                                   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |  |

# ALOS PALSAR DATA (Level 1.1/1.5)

## DATA FORMAT

【Revision I】

|               |               |
|---------------|---------------|
| October 2006  | Revision I    |
| May 2006      | Revision H    |
| October 2005  | Revision G    |
| May 2005      | Revision F    |
| February 2005 | Revision E    |
| June 2004     | Revision D    |
| March 2004    | Revision C    |
| July 2003     | Revision B    |
| February 2003 | Revision A    |
| February 2002 | First edition |

Remote Sensing Technology Center of Japan

# Revision History(1/1)

| Revision      | Date       | Revision Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First edition | 2002.2.5   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Rev.A         | 2003.2.28  | Chapter 3 : revision of the items in the Table-I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Rev.B         | 2003.7.4   | Chapter 1 and 2 : revision of 2-byte fonts<br>Chapter 4 : revision of the summary information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Rev.C         | 2004.3.1   | Chapter 1 : P1-4 Table1-7(a) : revision of the off-nadir angles of polarimetry mode (18.1deg. -> 17.9deg, 19.3 -> 19.2deg)<br>Chapter 3 : revision of the items in the Table-II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Rev.D         | 2004.6.22  | Chapter 2 : addition of "2.5 Low Resolution Image Data" and "2.6 PALSAR Browse Data"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Rev.E         | 2005.2.28  | Chapter 1 : P1-4 Table1-5 : revision of the level 1.1 azimuth length<br>Chapter 1 : P1-5 deletion of the remark on polarimetry mode<br>Chapter 1 : P1-6 addition of the remark 3<br>Chapter 1 : P1-9 addition of the remark (*3)<br>Chapter 3 : revision of the items in the Table-III<br>Chapter 4 : revision of the summary information                                                                                                                                                                                                                                                                                                                                              |
| Rev.F         | 2005.5.20  | Chapter 1 : P1-6 revision of the remark 3<br>Chapter 3 : revision of the items in the Table-IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Rev.G         | 2005.10.28 | Chapter 1 : P1-2 Table 1-2 : addition of the level 1.5 of Polarimetry mode<br>Chapter 1 : P1-3 Table 1-3 : deletion of the remark of the level 1.5,<br>Table 1-4 : addition of the pixel spacing and look number of Polarimetry mode<br>Chapter 1 : P1-4 Table 1-5 : deletion of the remark of the level 1.5<br>Chapter 1 : P1-5 Table 1-6 : addition of the remark about Polarimetry mode<br>Chapter 1 : P1-8~9 addition of Table 1-7 (e) and (f)<br>Chapter 2 : P2-5 Table 2-4 : addition of the level 1.5 of Polarimetry mode<br>Chapter 2 : P2-6 Table 2-6 addition of the level 1.5 of Polarimetry mode<br>Chapter 3 : P3-1 revision of page numbers and the items in the Table-V |
| Rev.H         | 2006.5.24  | Chapter 3 : P3-32 : addition of the description about "Stand-by 4" in Leaderfile Datasetsummary Record 413 - 444 bytes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Rev.I         | 2006.10.20 | Chapter 1 : P1-1 Table 1-1 : addition of the description about latitudes and longitudes in level 1.5 products.<br>Chapter 1 : P1-5 Table 1-6 : revision of the remark about Polarimetry mode<br>Chapter 1 : P1-10 Table 1-8 : addition of "97" to "ITRF"<br>Chapter 3 : revision of the items in the Table-VI                                                                                                                                                                                                                                                                                                                                                                          |

Table-I ALOS PALSAR DATA (Level 1.1/1.5) DATA FORMAT, Revision history from the first edition (1/1)

| Record                        | Bytes            | Format       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Contents                                       |
|-------------------------------|------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| VolumeDescriptorRecord        | <b>33-44</b>     | <b>CH</b>    | Logical volume generating facility software release and revision level<br>(i.e. name and version left justified) = 'NN.NNbbbbbbb'<br>1.00, 1.01, ..., 1.10, ..., 2.00                                                                                                                                                                                                                                                                                                                      | The value of Level 1.0 is copied               |
| TextRecord                    | <b>17-56</b>     | <b>CH</b>    | Product type specifier = 'PRODUCT:FGGGHIJbbbbbbbbbbbbbbbbbbbb'<br>where: F = Observation mode<br>H: Fine mode, W: Scan SAR mode, D: Direct Downlink mode<br>P: Polarimetry mode, C: Calibration mode<br>GGG = Process level<br>1.0: Level 1.0, 1.1: Level 1.1, 1.5: Level 1.5<br>H = Processing option parameter<br>G: Geo-code, _: not specified<br>I = Map projection<br>U: UTM, P: PS, M: MER, L: LCC, _: not specified<br>J = Ascending Node (Planning)<br>A: Ascending, D: Descending | The addition of the contents                   |
| SARLeaderFileDescriptorRecord | <b>33-44</b>     | <b>CH</b>    | Logical volume generating facility software release and revision level<br>(i.e. name and version left justified) = 'NN.NNbbbbbbb'<br>1.00, 1.01, ..., 1.10, ..., 2.00                                                                                                                                                                                                                                                                                                                      | The value of Level 1.0 is copied               |
|                               | <b>441-448</b>   | <b>I8</b>    | Facility data(2) record length = 'b4314000'                                                                                                                                                                                                                                                                                                                                                                                                                                                | Change of a storing value                      |
|                               | <b>519-524</b>   | <b>I6</b>    | Number of facility data(8) records = 'bbbb1'                                                                                                                                                                                                                                                                                                                                                                                                                                               | Change of a storing value                      |
| DataSetSummaryRecord          | <b>477-484</b>   | <b>F8.3</b>  | Sensor clock angle as measured relative to sensor platform flight direction (degrees)<br>(i.e.: -90:0=left pointing, and +90:0=right pointing) = always 'bb90.000'                                                                                                                                                                                                                                                                                                                         | Change of a storing value                      |
|                               | <b>759-762</b>   | <b>CH</b>    | Base band conversion flag (YESb/NOTb) (YES = base band converted)                                                                                                                                                                                                                                                                                                                                                                                                                          | Deletion of TBD                                |
|                               | <b>899-914</b>   | <b>F16.7</b> | Antenna electronic boresight relative to platform vertical axis<br>at the start of the image (degrees)                                                                                                                                                                                                                                                                                                                                                                                     | Deletion of TBD                                |
|                               | <b>915-930</b>   | <b>F16.7</b> | Antenna mechanical boresight relative to platform vertical axis at the start of the image,<br>positive to the right, negative to the left (degrees)                                                                                                                                                                                                                                                                                                                                        | Deletion of TBD                                |
|                               | <b>931-934</b>   | <b>CH</b>    | Echo tracker-on/off designator ('Onbb', or 'OFFb')                                                                                                                                                                                                                                                                                                                                                                                                                                         | Deletion of TBD                                |
|                               | <b>1071-1078</b> | <b>CH</b>    | Processing version identifier<br>Note: This is the same as software release and revision level                                                                                                                                                                                                                                                                                                                                                                                             | The value of Level 1.0 is copied               |
|                               |                  |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |
| FacilityRelatedDataRecord1-10 | <b>9-12</b>      | <b>B</b>     | Length of this record<br>Attitude determination 3 and GPSR raw data = 4314000<br>High Precision Attitude Information = 4370000                                                                                                                                                                                                                                                                                                                                                             | Determination and change<br>of a storing value |
| FacilityRelatedDataRecord11   | <b>489-800</b>   | <b>CH</b>    | Always blank filled                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Change of a byte position                      |
|                               | <b>801-1024</b>  | <b>CH</b>    | system reserve                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | The addition of an item                        |
| ImageFileDescriptorRecord     | <b>33-44</b>     | <b>CH</b>    | Logical volume generating facility software release and revision level<br>(i.e. name and version left justified) = 'NN.NNbbbbbbb'<br>1.00, 1.01, ..., 1.10, ..., 2.00                                                                                                                                                                                                                                                                                                                      | The value of Level 1.0 is copied               |
| TrailerFileDescriptorRecord   | <b>33-44</b>     | <b>CH</b>    | Logical volume generating facility software release and revision level<br>(i.e. name and version left justified) = 'NN.NNbbbbbbb'<br>1.00, 1.01, ..., 1.10, ..., 2.00                                                                                                                                                                                                                                                                                                                      | The value of Level 1.0 is copied               |

Table-I | ALOS PALSAR DATA (Level 1.1/1.5) DATA FORMAT, Revision history from Rev. B to Rev. C(1/1)

| Record                 | Bytes            | Format       | Description                                                                                                                                                            | Contents            |
|------------------------|------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| VolumeDescriptorRecord | <b>141-148</b>   | <b>CH</b>    | Logical volume generating agency (Japan Aerospace Exploration Agency) = 'JAXAbbbb'                                                                                     | Agency name         |
| Text Record            | <b>57-116</b>    | <b>CH</b>    | Location and date/time of product creation<br>= 'PROCESS:JAPAN-JAXA-EOC-ALOS-DPSbbYYYYMMDDbHHMMSSb - bb'<br>YYYYMMDD : Creation date(UT)<br>HHMMSS : Creation time(UT) | Agency name         |
| Dataset Summary Record | <b>1751-1766</b> | <b>F16.7</b> | Doppler center frequency linear term (b)<br><br>$fd = a + b R$ where fd : Doppler center frequency (Hz)<br>R : Slant range ( <u>km</u> )                               | unit of slant range |

Table-I || ALOS PALSAR DATA (Level 1.1/1.5) DATA FORMAT, Revision history from Rev. D to Rev. H(1/1)

| Record                            | Bytes          | Format    | Description                                                      | Contents                                           |
|-----------------------------------|----------------|-----------|------------------------------------------------------------------|----------------------------------------------------|
| Facility Related Data Record 1-10 | <b>8</b>       | <b>B</b>  | 3rd record sub-type code                                         | change NASDA to JAXA                               |
| Image File Descriptor Record      | <b>249-256</b> | <b>18</b> | Total number of data groups (or pixels) per line per SAR channel | addition of the description for level 1.1 products |
|                                   | <b>281-288</b> | <b>18</b> | Number of bytes of SAR data (or pixels) per line per SAR channel | ditto                                              |
| Signal Data Record                | <b>25-28</b>   | <b>B</b>  | Actual count of data pixels                                      | ditto                                              |

Table-IV ALOS PALSAR DATA (Level 1.1/1.5) DATA FORMAT, Revision history from Rev. E to Rev. F(1/1)

| Record                          | Bytes            | Format        | Description                                                                                                                                                             | Contents                                           |
|---------------------------------|------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| DataSetSummaryRecord            | <b>413-444</b>   | <b>CH</b>     | Sensor ID: and mode of operation for this channel = 'AAAAAA-BB-CCDE-bbbbbbbbbbbbbbbb'                                                                                   |                                                    |
|                                 |                  |               | DE : Code for imaging mode                                                                                                                                              | correction of a clerical error                     |
|                                 | <b>1671-1678</b> | <b>CH</b>     | Line content indicator (e.g.: 'RANGEbbb', 'AZIMUTHb' or 'OTHERbbb')<br>Level 1.1 = 'RANGEbbb'<br>Level 1.5 = 'OTHERbbb'                                                 | correction of a clerical error                     |
|                                 | <b>1987-2006</b> | <b>E20.13</b> | Incidence angle fifth term (a5)<br><br>$\theta = a_0 + a_1 R + a_2 R^2 + a_3 R^3 + a_4 R^4 + a_5 R^5$<br>where $\theta$ : Incidence angle (rad)<br>R : Slant range (km) | change unit of Slant range                         |
| PlatformPositionDataRecord      | <b>45-60</b>     | <b>F16.7</b>  | 1st orbital element (x) (m)                                                                                                                                             | addition of units                                  |
|                                 | <b>61-76</b>     | <b>F16.7</b>  | 2nd orbital element (y) (m)                                                                                                                                             |                                                    |
|                                 | <b>77-92</b>     | <b>F16.7</b>  | 3rd orbital element (z) (m)                                                                                                                                             |                                                    |
|                                 | <b>93-108</b>    | <b>F16.7</b>  | 4th orbital element (x') (m/sec)                                                                                                                                        |                                                    |
|                                 | <b>109-124</b>   | <b>F16.7</b>  | 5th orbital element (y') (m/sec)                                                                                                                                        |                                                    |
|                                 | <b>125-140</b>   | <b>F16.7</b>  | 6th orbital element (z') (m/sec)                                                                                                                                        |                                                    |
| RadiometricDataRecord           | <b>21-36</b>     | <b>F16.7</b>  | Calibration factor (CF)                                                                                                                                                 | correction of the equation                         |
| Facility Related Data Record 11 | <b>8</b>         | <b>B</b>      | 3rd record sub-type code                                                                                                                                                | change NASDA to JAXA                               |
|                                 | <b>465-472</b>   | <b>I8</b>     | SIGMA-SAR processing start line number                                                                                                                                  | correction of a clerical error                     |
| Image File Descriptor Record    | <b>249-256</b>   | <b>I8</b>     | Total number of data groups (or pixels) per line per SAR channel                                                                                                        | addition of the description for level 1.1 products |
|                                 | <b>281-288</b>   | <b>I8</b>     | Number of bytes of SAR data (or pixels) per line per SAR channel                                                                                                        | ditto                                              |
| Signal Data Record              | <b>25-28</b>     | <b>B</b>      | Actual count of data pixels                                                                                                                                             | ditto                                              |
|                                 | <b>45-48</b>     | <b>B</b>      | Sensor acquisition milliseconds of day (UT)                                                                                                                             | Deletion of '=0'                                   |
|                                 | <b>117-120</b>   | <b>B</b>      | Slant range to 1st data sample (meters)                                                                                                                                 | ditto                                              |

Table-V ALOS PALSAR DATA (Level 1.1/1.5) DATA FORMAT, Revision history from Rev. F to Rev. G(1/1)

| Record                  | Bytes                                                                                                                                                                                                                                        | Format                                                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Contents                                                                                                                                                                              |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DataSetSummaryRecord    | 1175-1190                                                                                                                                                                                                                                    | F16.7                                                                                                                                                                              | Nominal effective number of looks processed in Azimuth<br>Level 1.1 = 1.0<br>Level 1.5, High resolution mode (Single-Polarization), Pixel spacing 6.25 meter = 1.0->2.0<br>Pixel spacing 12.5 meter = 2.0,4.0->4.0<br>Polarimetry Mode, Pixel spacing 12.5 meter = 4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | correction of a clerical error<br>correction of a clerical error<br>addition                                                                                                          |
| MapProjectionDataRecord | 445-476<br>477-480<br>481-496<br>497-512<br><br>513-528<br>529-544<br>545-560<br>561-576<br>577-592<br><br>593-624<br>625-640<br>641-656<br>657-672<br><br>673-704<br><br>705-720<br>721-736<br>737-752<br>753-768<br>769-784<br><br>785-800 | CH<br>CH<br>F16.5<br>F16.5<br><br>F16.7<br>F16.7<br>CH<br>CH<br>F16.7<br><br>CH<br>F16.7<br>F16.7<br>F16.7<br><br>CH<br><br>F16.7<br>F16.7<br>F16.7<br>F16.7<br>F16.7<br><br>F16.7 | UTM descriptor = 'UNIVERSAL TRANSVERSE MERCATORb - b'<br>Signature of the UTM zone<br>Map origin (false easting) (meters) = 500000.00000<br>Map origin (false northing) (meters)<br>Northern Hemisphere = 0.00000<br>Southern Hemisphere = 10000000.00000<br>Centre of projection longitude (deg)<br>Centre of projection latitude (deg)<br>1st standard parallel (deg) = blanks<br>2nd standard parallel (deg) = blanks<br>Scale factor = 0.9996000<br><br>UPS descriptor = 'UNIVERSAL POLAR STEREOGRAPHICb - b'<br>Centre of projection longitude (deg)<br>Centre of projection latitude (deg)<br>Scale factor<br><br>Projection descriptor<br>MER-PROJECTION = 'MERCATORb - b'<br>LCC-PROJECTION = 'LAMBERT-CONFORMAL CONICb - b'<br>Map origin (false easting) (meters) = blanks<br>Map origin (false northing) (meters) = blanks<br>Centre of projection longitude (deg)<br>Centre of projection latitude (deg)<br>Standard parallels (deg)<br>MER-PROJECTION = blanks<br>LCC-PROJECTION = Standard parallels fai-1<br>Standard parallels (deg)<br>MER-PROJECTION = blanks<br>LCC-PROJECTION = Standard parallels fai-2 | addition of remark<br>except UTM<br><br><br><br><br><br><br><br><br><br>addition of remark<br>except UPS<br><br><br><br><br><br><br><br><br><br>addition of remark<br>except MER. LCC |
| RadiometricDataRecord   | 21-36<br><br>37-292<br><br>293-9860                                                                                                                                                                                                          | F16.7<br><br>F16.7<br><br>CH                                                                                                                                                       | Calibration factor (CF)<br><br>Transmission and reception distortion matrices for polarimetry mode<br><br>reserve (blanks)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | change of description<br><br>addition of description<br>and notes<br>change of byte number<br>of blanks                                                                               |

Table-VI ALOS PALSAR DATA (Level 1.1/1.5) DATA FORMAT, Revision history from Rev. H to Rev. I(1/1)

| Record                    | Bytes            | Format       | Description                                   | Contents                                              |
|---------------------------|------------------|--------------|-----------------------------------------------|-------------------------------------------------------|
| DataSetSummaryRecord      | <b>1207-1222</b> | <b>F16.7</b> | Bandwidth per look in Azimuth (Hz) $B_A$      | revision of the description                           |
|                           | <b>1239-1254</b> | <b>F16.7</b> | Total processor bandwidth in Azimuth (Hz)     | addition of the description                           |
|                           | <b>1687-1702</b> | <b>F16.7</b> | Line spacing (meter)                          | } revision of the description for level 1.1           |
|                           | <b>1703-1718</b> | <b>F16.7</b> | Pixel spacing (meter)                         |                                                       |
| MapProjectionDataRecord   | <b>945-960</b>   | <b>F16.7</b> | Top left corner northing (kilometers)         | } addition of the description of setting values       |
|                           | <b>961-976</b>   | <b>F16.7</b> | Top left corner easting (kilometers)          |                                                       |
|                           | <b>977-992</b>   | <b>F16.7</b> | Top right corner northing (kilometers)        |                                                       |
|                           | <b>993-1008</b>  | <b>F16.7</b> | Top right corner easting (kilometers)         |                                                       |
|                           | <b>1009-1024</b> | <b>F16.7</b> | Bottom right corner northing (kilometers)     |                                                       |
|                           | <b>1025-1040</b> | <b>F16.7</b> | Bottom right corner easting (kilometers)      |                                                       |
|                           | <b>1041-1056</b> | <b>F16.7</b> | Bottom left corner northing (kilometers)      |                                                       |
|                           | <b>1057-1072</b> | <b>F16.7</b> | Bottom left corner easting (kilometers)       |                                                       |
| RadiometricDataRecord     | <b>21-36</b>     | <b>F16.7</b> | Calibration factor (CF)                       | revision of the value for the expression of level 1.1 |
|                           |                  |              | Notes                                         | revision of the description                           |
| DataQualitySummaryRecord  | <b>95-110</b>    | <b>F16.7</b> | Estimate of SNR (from range spectra) (dB)     | addition of the unit                                  |
| ImageFileDescriptorRecord | <b>441-448</b>   | <b>I8</b>    | Maximum data range of pixel (starting form 0) | correction of the description for level 1.5           |
| ProcessedDataRecord       | <b>57-60</b>     | <b>B</b>     | PRF (mHz)                                     | addition of the notes                                 |

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## 1 Abstract

This document describes the products specifications for ALOS PALSAR data. The product specification formats are based on the CEOS (Committee on Earth Observation Satellites) revised standardized formats.

### 1.1 PALSAR Data Product Definitions

The definitions of PALSAR data products for processing levels are shown in Table 1-1 and the processing levels of observational modes are given in Table 1-2.

**Table 1-1 Processing Levels and Their Definitions**

| Processing Level | Definition                                                                                                                                                                                                                                                                                         |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.0              | The data of 1 scene area is extracted from received data.<br>Data type is 8 bit.<br>The number of SAR data files is the same as the number of polarizations in the case of dual polarization and polarimetry modes.<br>The data in SCAN SAR mode is not divided into individual scans.             |
| 1.1              | Range compression and 1 look azimuth compression are performed.<br>Data is complex data on the slant range coordinate.<br>The phase history is included.                                                                                                                                           |
| 1.5              | After range and multi-look azimuth compression are performed, radiometric and geometric corrections are performed according to the map projection.<br>Pixel spacing can be selected for the Fine mode.<br>Latitudes and longitudes in the product are calculated without considering the altitude. |

B  
I

**Table 1-2 Processing Levels of Observational Modes**

| Observation Mode     |                     | Processing Level |     |          | Remarks                   |
|----------------------|---------------------|------------------|-----|----------|---------------------------|
|                      |                     | 1.0              | 1.1 | 1.5      |                           |
| Fine mode            | Single polarization | O                | O   | O        | 18 beams                  |
|                      | Dual polarization   | O                | O   | O        | 18 beams                  |
| Scan SAR mode        | Burst mode 1        | O                | -   | O        | 3 scans, 4 scans, 5 scans |
|                      | Burst mode 2        | O                | -   | O        | 3 scans, 4 scans, 5 scans |
| Direct Downlink mode |                     | O                | O   | O        | 18 beams                  |
| Polarimetry mode     |                     | O                | O   | <u>O</u> | 12 beams                  |

Remark : Level 1.0 data sometimes includes calibration data as well as observation data.

B G



#### 1.4 Products Size

The definitions of the scene size are summarized in Table 1-5, the image frame sizes of level 1.5 are shown in Table 1-6.

And Table 1-7 shows sample numbers for each observational mode, off-nadir angle and others.

**Table 1-5 Definitions of Scene Size**

| Processing level | Scene Size<br>Range direction                                                | Scene Size<br>Azimuth direction                                                                                                                                                                              | Remarks                                                             |
|------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1.0              | Input signal data length<br>[corresponds to signal gate width]               | The size corresponds to the following length (includes synthetic aperture length)<br>· Except SCAN SAR mode<br>: 16.4 sec (corresponding to 110km)<br>· Scan SAR mode<br>: 57.0 sec (corresponding to 385km) | In the case of SCAN SAR mode, data is extracted at burst boundaries |
| 1.1              | Valid signal data length<br>[corresponds to signal gate width - pulse width] | <u>Fine/Direct Downlink modes:</u><br><u>51 to 79 km</u><br><u>Polarimetry mode: 62 to 83km</u>                                                                                                              | Except Scan SAR mode                                                |
| 1.5              | (refer to table 1-6)                                                         | (refer to table 1-6)                                                                                                                                                                                         | —                                                                   |

Remark : For level 1.0, the number of records and the record length are fixed according to observational modes and off-nadir angles.

**Table 1-6 Image Sizes of Level 1.5 Data**

| Observation mode              |                                       | Image Size<br>Range direction | Image Size<br>Azimuth direction |
|-------------------------------|---------------------------------------|-------------------------------|---------------------------------|
| Fine/Direct<br>Downlink modes | off-nadir angle 9.9 deg. - 43.4 deg.  | 70 km                         | (*)                             |
|                               | off-nadir angle 45.2 deg. - 50.0 deg. | 50 km                         |                                 |
|                               | off-nadir angle 50.8 deg.             | 40 km                         |                                 |
| Polarimetry mode              | off-nadir angle 9.7 deg. - 26.2 deg.  | (*)                           | (*)                             |
| SCAN SAR mode                 | 5 scan                                | 350 km                        | 350 km                          |
|                               | 4 scan                                | 300 km                        |                                 |
|                               | 3 scan                                | 250 km                        |                                 |

\*: Image size of azimuth direction is variable according to PRF and off-nadir angle.

- Fine mode and Direct Downlink mode: 51 – 79 km (Azimuth)
- Polarimetry mode: 20 – 65 km (Range), 62 – 83 km (Azimuth)

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**Table 1-7 (a) Image Size of PALSAR Level 1.1 Products (typical values)**

| Fine and Direct downlink modes |               |                            |                 | Polarimetry mode      |               |                 |
|--------------------------------|---------------|----------------------------|-----------------|-----------------------|---------------|-----------------|
| Off-nadir angle (deg)          | Range Samples |                            | Azimuth samples | Off-nadir angle (deg) | Range Samples | Azimuth samples |
|                                | Single        | Dual, Direct Downlink mode |                 |                       |               |                 |
| 9.9                            | 3,936         | 1,824                      | 18,432          | 9.7                   | 1,344         | 18,432          |
| 14.0                           | 5,088         | 2,400                      | 18,432          | 13.8                  | 1,472         | 18,432          |
| 18.0                           | 6,144         | 2,944                      | 18,432          | 16.2                  | 736           | 18,432          |
| 21.5                           | 7,168         | 3,456                      | 18,432          | 17.3                  | 768           | 18,432          |
| 25.8                           | 8,288         | 4,000                      | 18,432          | 17.9                  | 800           | 18,432          |
| 28.8                           | 9,056         | 4,384                      | 18,432          | 19.2                  | 832           | 18,432          |
| 30.8                           | 9,568         | 4,640                      | 18,432          | 20.5                  | 1,312         | 18,432          |
| 34.3                           | 10,400        | 5,088                      | 18,432          | 21.5                  | 1,344         | 18,432          |
| 36.9                           | 10,816        | 5,376                      | 18,432          | 23.1                  | 1,216         | 18,432          |
| 38.8                           | 11,296        | 5,600                      | 18,432          | 24.2                  | 1,024         | 18,432          |
| 41.5                           | 11,680        | 5,792                      | 18,432          | 25.2                  | 1,056         | 18,432          |
| 43.4                           | 12,256        | 6,080                      | 18,432          | 26.2                  | 1,120         | 18,432          |
| 45.2                           | 9,248         | 4,576                      | 18,432          |                       |               |                 |
| 46.6                           | 9,472         | 4,704                      | 18,432          |                       |               |                 |
| 47.5                           | 9,664         | 4,800                      | 18,432          |                       |               |                 |
| 49.0                           | 9,824         | 4,864                      | 18,432          |                       |               |                 |
| 50.0                           | 9,952         | 4,928                      | 18,432          |                       |               |                 |
| 50.8                           | 8,224         | 4,064                      | 18,432          |                       |               |                 |

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Remark 1: The output size for one processing segment in the azimuth direction is 9216 samples. The number of output azimuth samples is 18,432, corresponding to a size of two segments.

Remark 2: The Sampling Window Start Time (SWST) may vary slightly which can result in the number of output range samples changing by approximately 256 samples during processing.

Remark 3: For level 1.1 products, each data record corresponds to 1 image range line. Each range line begins at the nearest-range pixel and ends at the farthest-range pixel. Also, the first image record contains the earliest range line, and the last record contains the latest line.

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**Table 1-7(b) Image Frame Size and Data Capacity of Level 1.5 Products (rough estimation)**

**Fine and Direct downlink modes (Geo-reference)**

| Image Size<br>Range x Azimuth | Frame Size (Pixels) and Data Capacity (Megabytes) |                 |                  |                       |               |                  |
|-------------------------------|---------------------------------------------------|-----------------|------------------|-----------------------|---------------|------------------|
|                               | Pixel Spacing : 6.25m                             |                 |                  | Pixel Spacing : 12.5m |               |                  |
|                               | Range                                             | Azimuth         | Data<br>Capacity | Range                 | Azimuth       | Data<br>Capacity |
| 70 x 52 - 78km                | 11,200                                            | 8,900 - 13,100  | 280              | 5,600                 | 4,500 - 6,600 | 71               |
| 50 x 64 - 79km                | 8,000                                             | 10,300 - 13,100 | 200              | 4,000                 | 5,200 - 6,600 | 50               |
| 40 x 75 - 79km                | 6,400                                             | 12,000 - 13,100 | 160              | 3,200                 | 6,000 - 6,600 | 40               |

• 1 Megabyte =  $2^{20}$  Bytes

• Above table shows maximum capacities without considering data capacity increase due to methods of map projection and processing scene latitude.

• In PS (Polar Stereographic) projection, maximum capacity (at scene latitude of +/- 25deg.) may be twice as large as the values in the table.

**Table 1- 7(c) Image Frame Size and Data Capacity of Level 1.5 Products (rough estimation)**

**Fine and Direct downlink modes (Geo-code)**

| Pixel Spacing | Image Size<br>Range x Azimuth | Frame Size (Pixels) and Data Capacity (Megabytes) |                 |                  |
|---------------|-------------------------------|---------------------------------------------------|-----------------|------------------|
|               |                               | East - West                                       | South - North   | Data<br>Capacity |
| 6.25m         | 70 x 52 ~ 78km                | 8,300 ~ 17,200                                    | 11,200 ~ 17,200 | 558              |
|               | 50 x 64 ~ 79km                | 10,300 ~ 15,300                                   | 8,000 ~ 15,300  | 400              |
|               | 40 x 75 ~ 79km                | 12,000 ~ 14,600                                   | 6,400 ~ 14,600  | 320              |
| 12.5m         | 70 x 52 ~ 78km                | 4,200 ~ 8,600                                     | 5,600 ~ 8,600   | 140              |
|               | 50 x 64 ~ 79km                | 5,200 ~ 7,700                                     | 4,000 ~ 7,700   | 101              |
|               | 40 x 75 ~ 79km                | 6,000 ~ 7,300                                     | 3,200 ~ 7,300   | 81               |

• 1 Megabyte =  $2^{20}$  Bytes

• Above table shows maximum capacities without considering data capacity increase due to methods of map projection and processing scene latitude.

• In PS (Polar Stereographic) projection, maximum capacity (at scene latitude of +/- 25deg.) may be twice as large as the values in the table.

**Table 1-7(d) Image Frame Size and Data Capacity of Level 1.5 Products (rough estimation)**

**SCAN SAR mode**

| Image Size<br>Range x Azimuth | Frame Size (Pixels) and Data Capacity (Megabytes) |         |               |             |               |               |
|-------------------------------|---------------------------------------------------|---------|---------------|-------------|---------------|---------------|
|                               | Geo-reference                                     |         |               | Geo-code    |               |               |
|                               | Range                                             | Azimuth | Data Capacity | East - West | South - North | Data Capacity |
| 250km x 350km                 | 2,500                                             | 3,500   | 17            | 4,300       | 4,300         | 36            |
| 300km x 350km                 | 3,000                                             | 3,500   | 21            | 4,600       | 4,600         | 41            |
| 350km x 350km                 | 3,500                                             | 3,500   | 24            | 5,000       | 5,000         | 48            |

• 1 Megabyte =  $2^{20}$  Bytes

• Above table shows maximum capacities without considering data capacity increase due to methods of map projection and processing scene latitude.

• The maximum capacity in PS (Polar Stereographic) projection (at scene latitude of 0deg.) may be 4 times, that in MER (Mercator) projection (at latitude of +/- 73deg.) 11.7 times and that in LCC (Lambert-Conformal Conic) projection (at scene latitude of -52deg. in the case of the standard parallels  $\phi_1=50\text{deg.}$  and  $\phi_2=20\text{deg.}$ ) 12.1 times as large as the values in the table.

**Table 1-7(e) Image Frame Size and Data Capacity of Level 1.5 Products (rough estimation)**

**Polarimetry mode (Geo-reference)**

| Image Size<br>Range x Azimuth | Frame Size (Pixels) and Data Capacity<br>(Megabytes) |               |               |
|-------------------------------|------------------------------------------------------|---------------|---------------|
|                               | Pixel Spacing : 12.5m                                |               |               |
|                               | Range                                                | Azimuth       | Data Capacity |
| 65 x 63 ~ 68 km               | 5,200                                                | 5,100 ~ 5,800 | 230           |
| 50 x 64 ~ 69 km               | 4,000                                                | 5,200 ~ 5,800 | 177           |
| 20 x 63 ~ 83 km               | 1,600                                                | 5,100 ~ 6,800 | 83            |
| 30 x 64 ~ 72 km               | 2,400                                                | 5,200 ~ 5,900 | 108           |
| 25 x 68 ~ 73 km               | 2,000                                                | 5,500 ~ 6,000 | 92            |

- 1 Megabyte =  $2^{20}$  Bytes
- Above table shows maximum capacities for full-polarization without considering data capacity increase due to methods of map projection and processing scene latitude.
- In PS (Polar Stereographic) projection, maximum capacity (at scene latitude of +/- 25deg.) may be twice as large as the values in the table.

**Table 1-7(f) Image Frame Size and Data Capacity of Level 1.5 Products (rough estimation)**  
**Polarimetry mode (Geo-code)**

| Pixel Spacing | Image Size<br>Range x Azimuth | Frame Size (Pixels) and Data Capacity (Megabytes) |               |               |
|---------------|-------------------------------|---------------------------------------------------|---------------|---------------|
|               |                               | East – West                                       | South - North | Data Capacity |
| 12.5m         | 65 x 63 ~ 68 km               | 5,100 ~ 7,700                                     | 5,200 ~ 7,800 | 458           |
|               | 50 x 64 ~ 69 km               | 5,200 ~ 6,600                                     | 4,000 ~ 7,000 | 352           |
|               | 20 x 63 ~ 83 km               | 3,100 ~ 6,700                                     | 1,600 ~ 7,000 | 358           |
|               | 30 x 64 ~ 72 km               | 4,400 ~ 5,800                                     | 2,400 ~ 6,400 | 283           |
|               | 25 x 68 ~ 73 km               | 3,800 ~ 5,900                                     | 2,000 ~ 6,300 | 284           |

- 1 Megabyte =  $2^{20}$  Bytes
- Above table shows maximum capacities for full-polarization without considering data capacity increase due to methods of map projection and processing scene latitude.
- In PS (Polar Stereographic) projection, maximum capacity (at scene latitude of +/- 25deg.) may be twice as large as the values in the table.

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## 1.5 Processing Parameters

The processing parameters of each level are given in Table 1-8.

**Table 1-8 Summary of Processing Parameters**

| Items                                | Processing level |           |                                                                |
|--------------------------------------|------------------|-----------|----------------------------------------------------------------|
|                                      | 1.0              | 1.1       | 1.5                                                            |
| Map projection                       | -                | -         | UTM,PS<br>MER, LCC(*3)                                         |
| Framing (*1)                         | -                | -         | GR,GC                                                          |
| Image direction (*2)                 | -                | -         | Map                                                            |
| Resampling                           | -                | -         | NN,BL,CC                                                       |
| Geodetic coordinate<br>(Earth model) | -                | -         | ITRF97(GRS80)                                                  |
| Scene Shift                          | -5 to 4          | -5 to 4   | -5 to 4                                                        |
| Window Function                      | -                | rectangle | rectangle                                                      |
| Multi-look Number                    | -                | 1         | depending on<br>observational mode                             |
| Pixel Spacing                        | -                | -         | depending on<br>observational mode<br>and multi-look<br>number |

(\*1)GR: Geo-reference, GC: Geo-code

(\*2)valid in the case of Geo-coded

(\*3)UTM, PS, MER or LCC can be chosen in the case of SCAN SAR mode and UTM or PS can be chosen in other cases.

## 2 Product Formats

PALSAR product formats are based on the CEOS (Committee on Earth Observation Satellites) revised standardized formats.

### 2.1 Logical Volume

The image volume exists as a logical volume.

### 2.2 Order of Image Data

The order of image data is BSQ format.

### 2.3 File Composition

An image volume consists of 4 kinds of files. The file names and their contents are shown in Table 2-1 and Figure 2-1, the records composing those files are shown in Table 2-2.

**Table 2-1 File Composition and Definitions of File Names**

| File Name             | Definition of File Name    | Contents                                                                                                                                                          |
|-----------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Volume Directory File | VOL-Scene ID-Product ID    | This file is located at the beginning of the image volume and stores the volume and file management information.                                                  |
| Leader File           | LED-Scene ID-Product ID    | This file is located before image file and stores annotation data, ancillary data and other types of data related to the image data in the succeeding image file. |
| Image File            | IMG-XX-Scene ID-Product ID | This file is located after the leader file and stores the image data.                                                                                             |
| Trailer File          | TRL-Scene ID-Product ID    | This file is located after the image file and stores the final information related to the image data.                                                             |

XX: polarization (HH, HV, VH, VV) (order of transmitting, receiving)

Volume directory file

SAR leader file

SAR Image file

SAR image files repeat according to the number of polarizations in the case of dual polarization and polarimetric modes.

Trailer file

**Figure 2-1 File Composition of Product Format**

**Table 2-2 Record Composition of Each File**

| File / Record name                | Processing Level |     |     |
|-----------------------------------|------------------|-----|-----|
|                                   | 1.0              | 1.1 | 1.5 |
| a) Volume directory file          |                  |     |     |
| 1) Volume descriptor              | O                | O   | O   |
| 2) File pointer                   | O                | O   | O   |
| 3) Text                           | O                | O   | O   |
| b) SAR leader file                |                  |     |     |
| 1) File descriptor                | O                | O   | O   |
| 2) Data set summary               | O                | O   | O   |
| 3) Map projection data            | -                | -   | O   |
| 4) Platform position data         | O                | O   | O   |
| 5) Attitude data                  | O                | O   | O   |
| 6) Radiometric data               | -                | O   | O   |
| 7) Data quality summary           | -                | O   | O   |
| 8) Calibration data               | O                | -   | -   |
| 9) Facility related data          | O                | O   | O   |
| c) SAR Image file                 |                  |     |     |
| 1) File descriptor                | O                | O   | O   |
| 2) Signal data                    | O                | O   | -   |
| 3) Processed data                 | -                | -   | O   |
| d) Trailer file                   |                  |     |     |
| 1) File descriptor                | O                | O   | O   |
| 2) Low resolution image data (*1) | -                | O   | O   |

(\*1) This record is not included in the products of Scan SAR mode

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## 2.4 Record Length and Record Number

Table 2-3 shows the record lengths and the number of records of each file.

**Table 2-3 Record Lengths and The Number of Records of Each File**

| File/Record Name                  | Record length | Record number                                |
|-----------------------------------|---------------|----------------------------------------------|
| a) Volume Directory File          |               |                                              |
| 1) Volume descriptor              | 360           | 1                                            |
| 2) File pointer                   | 360           | Number of SAR Image Files + 2<br>(*1)        |
| 3) Text                           | 360           | 1                                            |
| b) SAR Leader File                |               |                                              |
| 1) File descriptor                | 720           | 1                                            |
| 2) Data set summary               | 4096          | 1                                            |
| 3) Map projection data            | 1620          | 1                                            |
| 4) Platform position data         | 4680          | 1                                            |
| 5) Attitude data                  | 8192          | 1                                            |
| 6) Radiometric data               | 9860          | 1                                            |
| 7) Data quality summary           | 1620          | 1                                            |
| 8) Calibration data               | 13212         | 1                                            |
| 9) Facility related               | Variable      | 10 (for level 1.0)<br>11 (for level 1.1/1.5) |
| c) SAR Image File(s)              |               |                                              |
| 1) File descriptor                | 720           | 1                                            |
| 2) Signal data                    | (*2)          | (*2)                                         |
| 3) Processed data                 | (*2)          | (*2)                                         |
| d) Trailer File                   |               |                                              |
| 1) File descriptor                | 720           | 1                                            |
| 2) Low resolution image data (*3) | Variable      | 1                                            |

(\*1) There is one file pointer for each SAR Image File (according to the number of polarizations) plus one for the SAR leader file and one for the trailer file.

(\*2) Refer to table 1-7

(\*3) This record is not included in the products of SCAN SAR mode.

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## 2.5 Low Resolution Image Data

Low resolution image data which is contained in a trailer file is 16 bit per pixel data which is created by equalizing a processed image so that pixel spacing is set to 100m. The conditions for creation of low resolution image data, the format, etc. are summarized in Table 2-4 and Table 2-5. In the cases of the fine mode (dual polarization) and polarimetry mode, low resolution image data in HH or VV polarization is produced.

**Table 2-4 Conditions for creation of low resolution image data**

| Observation Mode                   | Processing Level             |                                                                          |
|------------------------------------|------------------------------|--------------------------------------------------------------------------|
|                                    | 1.1                          | 1.5                                                                      |
| Fine mode and Direct Downlink mode | Create geo-referenced image. | Create low resolution image with the same frame as product image.        |
| Scan SAR mode                      | Not Created.                 |                                                                          |
| Polarimetry mode                   | Create geo-referenced image. | <u>Create low resolution image with the same frame as product image.</u> |

**Table 2-5 Format of low resolution image data**

| Format Factor         | Specification                                                                                                                                                                                                                                                                                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data type             | 16 bit integer                                                                                                                                                                                                                                                                                                      |
| Record length         | Variable (multiples of 100)                                                                                                                                                                                                                                                                                         |
| The Number of Records | Variable (multiples of 100)                                                                                                                                                                                                                                                                                         |
| Pixel spacing         | 100 m                                                                                                                                                                                                                                                                                                               |
| Map projection        | <ul style="list-style-type: none"> <li>- S 84 deg. <math>\leq \phi \leq</math> N 84 deg. : UTM</li> <li>- S 90 deg. <math>\leq \phi &lt;</math> S 84 deg. or<br/>N 84 deg. <math>&lt; \phi \leq</math> N 90 deg. : PS</li> </ul> <p style="text-align: right;"><math>\phi</math> : scene center latitude (deg.)</p> |

## 2.6 PALSAR Browse Data (for reference)

Based on the conditions in Table 2-6, PALSAR browse data is normalized to 8 bit processed images, and is created by equalizing such that pixel spacing is set to 100m. The format, pixel spacing, map projection etc. are summarized in Table 2-7. In the cases of the fine mode (dual polarization) and polarimetry mode, browse data in HH or VV polarization is produced.

The browse data for processed scenes is specified in inventory information as image catalog data with JPEG compression.

**Table 2-6 Conditions for creation of PALSAR browse data**

| Observation Mode                   | Processing Level                                                            |     |
|------------------------------------|-----------------------------------------------------------------------------|-----|
|                                    | 1.1                                                                         | 1.5 |
| Fine mode and Direct Downlink mode | Create geo-referenced image when PALSAR browse data creation flag is “YES”. |     |
| Scan SAR mode                      | Not Created.                                                                |     |
| Polarimetry mode                   | Create geo-referenced image when PALSAR browse data creation flag is “YES”. |     |

**Table 2-7 Format of PALSAR browse data**

| Format Factor         | Specification                                                                                                                                                                                                                                                    |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| File name             | Emergency/Normal flag (1 character) + scene ID.BRS                                                                                                                                                                                                               |
| Data type             | 8 bit integer                                                                                                                                                                                                                                                    |
| Record length         | Variable (multiples of 100)                                                                                                                                                                                                                                      |
| The Number of Records | Variable (multiples of 100)                                                                                                                                                                                                                                      |
| Image frame           | Geo-referenced                                                                                                                                                                                                                                                   |
| Pixel spacing         | 100 m                                                                                                                                                                                                                                                            |
| Map projection        | <ul style="list-style-type: none"> <li>- S 84 deg. &lt;= phi &lt;= N 84 deg. : UTM</li> <li>- S 90 deg. &lt;= phi &lt; S 84 deg. or<br/>N 84 deg. &lt; phi &lt;= N 90 deg. : PS</li> </ul> <p style="text-align: center;">phi : scene center latitude (deg.)</p> |

### 3 Record Formats

#### 3.1 Volume Directory File

The record formats for the volume directory file describe as follows.

|                |                          |
|----------------|--------------------------|
| p. 3-2 - 3-6   | Volume Descriptor Record |
| p. 3-7 - 3-12  | File Pointer Record      |
| p. 3-13 - 3-15 | Text Record              |

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#### 3.2 SAR Leader File

The record formats for the SAR leader file for level 1.1 and 1.5 describes as follows.

|                |                               |
|----------------|-------------------------------|
| p. 3-16 - 3-27 | File Descriptor Record        |
| p. 3-28 - 3-48 | Data set Summary Record       |
| p. 3-49 - 3-60 | Map Projection Data Record    |
| p. 3-61 - 3-64 | Platform Position Data Record |
| p. 3-65 - 3-67 | Attitude Data Record          |
| p. 3-68 - 3-70 | Radiometric Data Record       |
| p. 3-71 - 3-75 | Data Quality Summary Record   |
| p. 3-76 - 3-82 | Facility Related Data Record  |

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#### 3.3 SAR Image File

The following tables show the record formats for the SAR data file(s).

|                  |                        |
|------------------|------------------------|
| p. 3-83 - 3-96   | File Descriptor Record |
| p. 3-97 - 3-103  | Signal Data Record     |
| p. 3-104 - 3-110 | Processed Data Record  |

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#### 3.4 SAR Trailer File

The following tables show the record formats for the SAR trailer file.

|                  |                                  |
|------------------|----------------------------------|
| p. 3-111 - 3-120 | File Descriptor Record           |
| p. 3-121 - 3-121 | Low Resolution Image Data Record |

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VolumeDescriptorRecord ( 1 / 5 )

| Bytes        | Format    | Description                                                                                 | Contents                         |
|--------------|-----------|---------------------------------------------------------------------------------------------|----------------------------------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number = 1                                                                  | The value of Level 1.0 is copied |
| <b>5</b>     | <b>B</b>  | 1st record subtype code = 192                                                               | The value of Level 1.0 is copied |
| <b>6</b>     | <b>B</b>  | Record type code = 192                                                                      | The value of Level 1.0 is copied |
| <b>7</b>     | <b>B</b>  | 2nd subtype code = 18                                                                       | The value of Level 1.0 is copied |
| <b>8</b>     | <b>B</b>  | 3rd subtype code = 18                                                                       | The value of Level 1.0 is copied |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 360                                                                 | The value of Level 1.0 is copied |
| <b>13-14</b> | <b>CH</b> | ASCII/EBCDIC flag = 'Ab' for ASCII                                                          | The value of Level 1.0 is copied |
| <b>15-16</b> | <b>CH</b> | blanks                                                                                      | The value of Level 1.0 is copied |
| <b>17-28</b> | <b>CH</b> | Superstructure format control document ID. (the ID of the CCB document)<br>= 'CEOS-SAR-CCT' | The value of Level 1.0 is copied |
| <b>29-30</b> | <b>CH</b> | Superstructure format control document revision level = 'bA' - 'bZ'                         | The value of Level 1.0 is copied |

# VolumeDescriptorRecord ( 2 / 5 )

| Bytes        | Format    | Description                                                                                                                                                        | Contents                         |
|--------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>31-32</b> | <b>CH</b> | Superstructure record format revision level = 'bA' - 'bZ'                                                                                                          | The value of Level 1.0 is copied |
| <b>33-44</b> | <b>CH</b> | Logical volume generating facility software release and revision level (i.e. name and version left justified) = 'NN.NNbbbbbbb'<br>1.00, 1.01, ..., 1.10, ..., 2.00 | The value of Level 1.0 is copied |
| <b>45-60</b> | <b>CH</b> | ID of physical volume containing this volume descriptor (tape ID) = 'EOC-bbbbbbbbbbbb'                                                                             | The value of Level 1.0 is copied |

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**VolumeDescriptorRecord ( 3 / 5 )**

| Bytes         | Format    | Description                                                                                                                                                                                                                                                                                                                    | Contents                             |
|---------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| <b>61-76</b>  | <b>CH</b> | Logical volume ID (scene related information uniquely identifying this logical volume) = 'MMNSSSYYYYMMDDbb'<br>MM : Mission ID (ALOS='AL') (*1)<br>N : Mission number (ALOS='1') (*1)<br>SSS : Sensor ID (PALSAR='PSR') (*1)<br>YYYY : Product generation year<br>MM : Product generation month<br>DD : Product generation day | (*1)The value of Level 1.0 is copied |
| <b>77-92</b>  | <b>CH</b> | Volume set ID (16 character string assigned to uniquely identify a multiple physical volume data set.) = 'MMMMMMbSSSSSbbb'<br>MMMMMM : Mission name ('ALOSbb')<br>SSSSSS : Sensor name (PALSAR='PALSAR')                                                                                                                       | The value of Level 1.0 is copied     |
| <b>93-94</b>  | <b>I2</b> | Total number of physical volumes in the logical volume = 'b1'                                                                                                                                                                                                                                                                  | The value of Level 1.0 is copied     |
| <b>95-96</b>  | <b>I2</b> | Physical volume sequence number of the first tape within the logical volume = 'b1'                                                                                                                                                                                                                                             | The value of Level 1.0 is copied     |
| <b>97-98</b>  | <b>I2</b> | Physical volume sequence number of the last tape within the logical volume = 'b1'                                                                                                                                                                                                                                              | The value of Level 1.0 is copied     |
| <b>99-100</b> | <b>I2</b> | Physical volume sequence number of the current tape within the logical volume = 'b1'                                                                                                                                                                                                                                           | The value of Level 1.0 is copied     |

VolumeDescriptorRecord ( 4 / 5 )

| Bytes          | Format    | Description                                                                                                                                                                                          | Contents                         |
|----------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>101-104</b> | <b>I4</b> | First referenced file number in this physical volume within the logical volume,<br>i.e.: the first file which follows this volume directory<br>= 'bbb3' - 'bbb6' : N+2 (N is number of polarization) | The value of Level 1.0 is copied |
| <b>105-108</b> | <b>I4</b> | Logical volume within a volume set = 'bbb1'                                                                                                                                                          | The value of Level 1.0 is copied |
| <b>109-112</b> | <b>I4</b> | Logical volume number within physical volume (if a logical volume spans physical<br>volumes, the portion of the logical volume on this tape is counted as an entire<br>logical volume) = 'bbb1'      | The value of Level 1.0 is copied |
| <b>113-120</b> | <b>CH</b> | Logical volume creation data = 'YYYYMMDD'<br>where YYYY : Year<br>MM : Month<br>DD : Day                                                                                                             |                                  |
| <b>121-128</b> | <b>CH</b> | Logical volume creation time = 'HHMMSSXX'<br>where HH : Hour<br>MM : Minute<br>SS : Second<br>XX : 10mili-second                                                                                     |                                  |
| <b>129-140</b> | <b>CH</b> | Logical volume generation country (JAPAN) = 'JAPANbbbbbbb'                                                                                                                                           | The value of Level 1.0 is copied |
| <b>141-148</b> | <b>CH</b> | Logical volume generating agency (Japan Aerospace Exploration Agency) = 'JAXAbbbb'                                                                                                                   | The value of Level 1.0 is copied |

|C

**VolumeDescriptorRecord ( 5 / 5 )**

| Bytes          | Format    | Description                                                                                                       | Contents                         |
|----------------|-----------|-------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>149-160</b> | <b>CH</b> | Logical volume generating facility (ALOS Data Processing Sub-system at Earth Observation Center) = 'EOC-ALOS-DPS' | The value of Level 1.0 is copied |
| <b>161-164</b> | <b>I4</b> | Number of file pointer records in volume directory<br>= 'bbb3' - 'bbb6': N+2 (N is number of polarization)        | The value of Level 1.0 is copied |
| <b>165-168</b> | <b>I4</b> | Number of records in volume directory = 'bbb1'                                                                    | The value of Level 1.0 is copied |
| <b>169-260</b> | <b>CH</b> | Volume descriptor spare segment (always blank filled)                                                             | The value of Level 1.0 is copied |
| <b>261-360</b> | <b>CH</b> | Local use segment                                                                                                 | The value of Level 1.0 is copied |

# FilePointerRecoed ( 1 / 6 )

| Bytes       | Format   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                           | Contents                         |
|-------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>1-4</b>  | <b>B</b> | Record sequence number<br>In case of High Resolution Mode(Single-Polarization),<br>Direct Down link Mode and Wide Observation Mode :<br>SAR Leader File = 2<br>SAR Data File = 3<br>SAR Trailer File = 4<br>In case of High Resolution Mode(Dual-Polarization) :<br>SAR Leader File = 2<br>SAR Data File = 3, 4<br>SAR Trailer File = 5<br>In case of Polarimetry Mode :<br>SAR Leader File = 2<br>SAR Data File = 3, 4, 5, 6<br>SAR Trailer File = 7 | The value of Level 1.0 is copied |
| <b>5</b>    | <b>B</b> | 1st record subtype code = 219                                                                                                                                                                                                                                                                                                                                                                                                                         | The value of Level 1.0 is copied |
| <b>6</b>    | <b>B</b> | record type code = 192                                                                                                                                                                                                                                                                                                                                                                                                                                | The value of Level 1.0 is copied |
| <b>7</b>    | <b>B</b> | 2nd subtype code = 18                                                                                                                                                                                                                                                                                                                                                                                                                                 | The value of Level 1.0 is copied |
| <b>8</b>    | <b>B</b> | 3rd record sub-type code = 18                                                                                                                                                                                                                                                                                                                                                                                                                         | The value of Level 1.0 is copied |
| <b>9-12</b> | <b>B</b> | Length of this record = 360                                                                                                                                                                                                                                                                                                                                                                                                                           | The value of Level 1.0 is copied |

**FilePointerRecoed ( 2 / 6 )**

| Bytes        | Format    | Description                                                                                                                                                                                                                                                                                                                                                                                                  | Contents                                                                               |
|--------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>13-14</b> | <b>CH</b> | ASCII/EBCDIC flag = 'Ab' for ASCII                                                                                                                                                                                                                                                                                                                                                                           | The value of Level 1.0 is copied                                                       |
| <b>15-16</b> | <b>CH</b> | blanks                                                                                                                                                                                                                                                                                                                                                                                                       | The value of Level 1.0 is copied                                                       |
| <b>17-20</b> | <b>I4</b> | Referenced file number<br>SAR Leader File = 'bbb1'<br>SAR Data File = 'bbb2'<br>SAR Trailer File = 'bbb3'                                                                                                                                                                                                                                                                                                    | The value of Level 1.0 is copied                                                       |
| <b>21-36</b> | <b>CH</b> | Referenced file name (16 characters indicating nature of the data, i.e. header, annotation, SAR product type, etc.) = 'MMNbSSSTFFFFbbbb'<br>MM : Mission ID (ALOS='AL') (*2)<br>N : Mission number (ALOS='1') (*2)<br>SSS : Sensor ID (PALSAR='PSR') (*2)<br>T : Processing Level Code (*1)<br>FFFF : File Type Code (*2)<br>SAR Leader File = 'SARL'<br>SAR Data File = 'IMOP'<br>SAR Trailer File = 'SART' | (*1)<br>'B' : Level 1.1<br>'C' : Level 1.5<br><br>(*2)The value of Level 1.0 is copied |

# FilePointerRecoed ( 3 / 6 )

| Bytes         | Format    | Description                                                                                                                                                                         | Contents                         |
|---------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>37-64</b>  | <b>CH</b> | Referenced file class<br>SAR Leader File = 'SARLEADERbFILEbbbbbbbbbbbbbb'<br>SAR Data File = 'IMAGERYbOPTIONSbFILEbbbbbbbbbb'<br>SAR Trailer File = 'SARTRAILERbFILEbbbbbbbbbbbbbb' | The value of Level 1.0 is copied |
| <b>65-68</b>  | <b>CH</b> | Referenced file class code<br>SAR Leader File = 'SARL'<br>SAR Data File = 'IMOP'<br>SAR Trailer File = 'SART'                                                                       | The value of Level 1.0 is copied |
| <b>69-96</b>  | <b>CH</b> | Referenced file data type<br>= 'MIXEDbBINARYbANDBASCIIbbbbbb'                                                                                                                       | The value of Level 1.0 is copied |
| <b>97-100</b> | <b>CH</b> | Referenced file data type code<br>= 'MBAA'                                                                                                                                          | The value of Level 1.0 is copied |

# FilePointerRecoed ( 4 / 6 )

| Bytes          | Format    | Description                                                                                                                                                                                                                                                                                                                                      | Contents                         |
|----------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>101-108</b> | <b>I8</b> | <p>Number of records in referenced file</p> <p>SAR Leader File = 'bbbbbb17' (Level 1.1)<br/> = 'bbbbbb18' (Level 1.5)</p> <p>SAR Data File = N+1 (N is number of SAR DATA records)</p> <p>SAR Trailer File = N+1 (N is number of low resolution image data records) (Except Wide Observation Mode)<br/> = 'bbbbbbb1' (Wide Observation Mode)</p> |                                  |
| <b>109-116</b> | <b>I8</b> | <p>Referenced file 1-st record length (length of the first record in the file)</p> <p>= 'bbbbbb720'</p>                                                                                                                                                                                                                                          | The value of Level 1.0 is copied |

**FilePointerRecoed ( 5 / 6 )**

| Bytes          | Format    | Description                                                                                                                                                                                                                               | Contents                                                                                          |
|----------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>117-124</b> | <b>I8</b> | Referenced file maximum record length (length of largest record in the file)                                                                                                                                                              |                                                                                                   |
| <b>125-136</b> | <b>CH</b> | Referenced file record length type<br>SAR Leader File = 'VARIABLEbLEN'<br>SAR Data File = 'VARIABLEbLEN'<br>SAR Trailer File (Wide Observation Mode) = 'FIXEDbLENGTH'<br>SAR Trailer File (Except Wide Observation Mode) = 'VARIABLEbLEN' | In except SAR Trailer File<br>(Except Wide Observation Mode),<br>the value of Level 1.0 is copied |
| <b>137-140</b> | <b>CH</b> | Referenced file record length type code<br>SAR Leader File = 'VARE'<br>SAR Data File = 'VARE'<br>SAR Trailer File (Wide Observation Mode) = 'FIXD'<br>SAR Trailer File (Except Wide Observation Mode) = 'VARE'                            | In except SAR Trailer File<br>(Except Wide Observation Mode),<br>the value of Level 1.0 is copied |

**FilePointerRecoed ( 6 / 6 )**

| Bytes          | Format    | Description                                                                                                                                                                                                                                                                                                                                                                                                                       | Contents                         |
|----------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>141-142</b> | <b>I2</b> | Referenced file physical volume start number (the number of the physical volume set containing the first record of the file) = 'b1'                                                                                                                                                                                                                                                                                               | The value of Level 1.0 is copied |
| <b>143-144</b> | <b>I2</b> | Referenced file physical volume end number (the number of the physical volume set containing the last record of the file) = 'b1'                                                                                                                                                                                                                                                                                                  | The value of Level 1.0 is copied |
| <b>145-152</b> | <b>I8</b> | Referenced file portion start, 1-st record number for this physical volume (record number of the first record appearing on this physical volume)<br>= bbbbbbb1'                                                                                                                                                                                                                                                                   | The value of Level 1.0 is copied |
| <b>153-160</b> | <b>I8</b> | Referenced file portion end, last record number for this physical volume (record number of the last record appearing on this physical volume)<br>SAR Leader File = 'bbbbbb17' (Level 1.1)<br>= 'bbbbbb18' (Level 1.5)<br>SAR Data File = N+1 (N is number of SAR DATA records)<br>SAR Trailer File = N+1 (N is number of low resolution image data records) (Except Wide Observation Mode)<br>= 'bbbbbb1' (Wide Observation Mode) |                                  |
| <b>161-360</b> | <b>CH</b> | blanks                                                                                                                                                                                                                                                                                                                                                                                                                            | The value of Level 1.0 is copied |

TextRecoed ( 1 / 3 )

| Bytes        | Format    | Description                                                                                                           | Contents                         |
|--------------|-----------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number = N+4<br>where N = 'Number of polarization'                                                    | The value of Level 1.0 is copied |
| <b>5</b>     | <b>B</b>  | 1st record sub-type code = 18                                                                                         | The value of Level 1.0 is copied |
| <b>6</b>     | <b>B</b>  | Record type code = 192                                                                                                | The value of Level 1.0 is copied |
| <b>7</b>     | <b>B</b>  | 2nd record sub-type code = 18                                                                                         | The value of Level 1.0 is copied |
| <b>8</b>     | <b>B</b>  | 3rd record sub-type code = 18                                                                                         | The value of Level 1.0 is copied |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 360                                                                                           | The value of Level 1.0 is copied |
| <b>13-14</b> | <b>CH</b> | ASCII/EBCDIC flag = 'Ab' for ASCII                                                                                    | The value of Level 1.0 is copied |
| <b>15-16</b> | <b>CH</b> | Continuation flag ('Cb' if information is continued on the next text record,<br>else 'bb' for no continuation) = 'bb' | The value of Level 1.0 is copied |

TextRecoed ( 2 / 3 )

| Bytes   | Format | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Contents                         |
|---------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 17-56   | CH     | Product type specifier = 'PRODUCT:FGGGHIJbbbbbbbbbbbbbbbbbbbbbb'<br>where: F = Observation mode<br>H: Fine mode, W: Scan SAR mode, D: Direct Downlink mode<br>P: Polarimetry mode, C: Calibration mode<br>GGG = Process level<br>1.0: Level 1.0, 1.1: Level 1.1, 1.5: Level 1.5<br>H = Processing option parameter<br>G: Geo-code, _: not specified<br>I = Map projection<br>U: UTM, P: PS, M: MER, L: LCC, _: not specified<br>J = Ascending Node (Planning)<br>A: Ascending, D: Descending |                                  |
| 57-116  | CH     | Location and date/time of product creation<br>= 'PROCESS:JAPAN-JAXA-EOC-ALOS-DPSbbYYYYMMDDbHHMMSSb - bb'<br>YYYYMMDD : Creation date(UT)<br>HHMMSS : Creation time(UT)                                                                                                                                                                                                                                                                                                                       |                                  |
| 117-156 | CH     | Physical volumes identification<br>= 'TAPEbID:bbbbbbbbbbbbbbbbbbbbbbbbbb'                                                                                                                                                                                                                                                                                                                                                                                                                    | The value of Level 1.0 is copied |

A

C

TextRecoed ( 3 / 3 )

| Bytes   | Format | Description                                                                                                                                                                                                                                                  | Contents                                          |
|---------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| 157-196 | CH     | Scene identification = 'ORBITb:AABBBBCDDDDDEEEEbbbbbbbbbbbbbbbbbb'<br>where : AA = Satellite ID ('AL')<br>BBB = Sensor ID ('PSR')<br>C = Sensor Sub-ID<br>DDDDD = Orbit accumulation number of a scene center<br>EEEE = Scene frame number of a scene center | The value of Level 1.0 is copied                  |
| 197-236 | CH     | Scene location<br>Level 1.1 = 'FRAMEbCENTRE:bbbbbbbbbbbbbbbbbbbbbb'<br>Level 1.5 = 'FRAMEbCENTRE:bN+(or -)nnn.nnbbE+(or -)nnn.nnbbbbbb'<br>where : N+(or -)nnn.nn = latitude of a scene center (deg)<br>E+(or -)nnn.nn = longitude of a scene center (deg)   | In Level 1.1,<br>the value of Level 1.0 is copied |
| 237-360 | CH     | blanks                                                                                                                                                                                                                                                       | The value of Level 1.0 is copied                  |

# SARLeaderFileDescriptorRecord ( 1 / 12 )

| Bytes        | Format    | Description                                                                                                        | Contents                         |
|--------------|-----------|--------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number = 1                                                                                         | The value of Level 1.0 is copied |
| <b>5</b>     | <b>B</b>  | 1st record subtype code = 11                                                                                       | The value of Level 1.0 is copied |
| <b>6</b>     | <b>B</b>  | Record type code = 192                                                                                             | The value of Level 1.0 is copied |
| <b>7</b>     | <b>B</b>  | 2nd subtype code = 18                                                                                              | The value of Level 1.0 is copied |
| <b>8</b>     | <b>B</b>  | 3rd subtype code = 18                                                                                              | The value of Level 1.0 is copied |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 720                                                                                        | The value of Level 1.0 is copied |
| <b>13-14</b> | <b>CH</b> | ASCII/EBCDIC flag = 'Ab' for ASCII                                                                                 | The value of Level 1.0 is copied |
| <b>15-16</b> | <b>CH</b> | Continuation flag ('Cb' if information is continued on the next text record, else 'bb' for no continuation) = 'bb' | The value of Level 1.0 is copied |
| <b>17-28</b> | <b>CH</b> | Format control document ID for this data file format (the ID of this document) = 'CEOS-SAR-CCT'                    | The value of Level 1.0 is copied |

**SARLeaderFileDescriptorRecord ( 2 / 12 )**

| Bytes        | Format    | Description                                                                                                                                                           | Contents                         |
|--------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>29-30</b> | <b>CH</b> | Format control document revision level = 'bA'                                                                                                                         | The value of Level 1.0 is copied |
| <b>31-32</b> | <b>CH</b> | File design descriptor revision letter = 'bA'                                                                                                                         | The value of Level 1.0 is copied |
| <b>33-44</b> | <b>CH</b> | Logical volume generating facility software release and revision level<br>(i.e. name and version left justified) = 'NN.NNbbbbbbb'<br>1.00, 1.01, ..., 1.10, ..., 2.00 | The value of Level 1.0 is copied |
| <b>45-48</b> | <b>I4</b> | File number = 'bbb1'                                                                                                                                                  | The value of Level 1.0 is copied |

A

# SARLeaderFileDescriptorRecord ( 3 / 12 )

| Bytes        | Format    | Description                                                                                                                                                                                                                                                                                                                                           | Contents                                                                               |
|--------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>49-64</b> | <b>CH</b> | Referenced file name (16 characters indicating nature of the data, i.e. header, annotation, SAR product type, etc.) = 'MMNbSSSTFFFFbbbb'<br>MM : Mission ID (ALOS='AL') (*2)<br>N : Mission number (ALOS='1') (*2)<br>SSS : Sensor ID (PALSAR='PSR') (*2)<br>T : Processing Level Code (*1)<br>FFFF : File Type Code (*2)<br>SAR Leader File = 'SARL' | (*1)<br>'B' : Level 1.1<br>'C' : Level 1.5<br><br>(*2)The value of Level 1.0 is copied |

**SARLeaderFileDescriptorRecord ( 4 / 12 )**

| Bytes          | Format    | Description                                        | Contents                         |
|----------------|-----------|----------------------------------------------------|----------------------------------|
| <b>65-68</b>   | <b>CH</b> | Record sequence and location type flag<br>= 'FSEQ' | The value of Level 1.0 is copied |
| <b>69-76</b>   | <b>I8</b> | Sequence number location<br>= 'bbbbbbb1'           | The value of Level 1.0 is copied |
| <b>77-80</b>   | <b>I4</b> | Sequence number field length<br>= 'bbb4'           | The value of Level 1.0 is copied |
| <b>81-84</b>   | <b>CH</b> | Record code and location type flag<br>= 'FTYP'     | The value of Level 1.0 is copied |
| <b>85-92</b>   | <b>I8</b> | Record code location<br>= 'bbbbbbb5'               | The value of Level 1.0 is copied |
| <b>93-96</b>   | <b>I4</b> | Record code field length<br>= 'bbb4'               | The value of Level 1.0 is copied |
| <b>97-100</b>  | <b>CH</b> | Record length and location type flag<br>= 'FLGT'   | The value of Level 1.0 is copied |
| <b>101-108</b> | <b>I8</b> | Record length location<br>= 'bbbbbbb9'             | The value of Level 1.0 is copied |

SARLeaderFileDescriptorRecord ( 5 / 12 )

| Bytes          | Format    | Description                            | Contents                         |
|----------------|-----------|----------------------------------------|----------------------------------|
| <b>109-112</b> | <b>I4</b> | Record length field length<br>= 'bbb4' | The value of Level 1.0 is copied |
| <b>113-180</b> | <b>CH</b> | blanks                                 | The value of Level 1.0 is copied |

# SARLeaderFileDescriptorRecord ( 6 / 12 )

| Bytes          | Format    | Description                                                                             | Contents                         |
|----------------|-----------|-----------------------------------------------------------------------------------------|----------------------------------|
| <b>181-186</b> | <b>I6</b> | Number of data set summary records<br>= 'bbbbbb1'                                       | The value of Level 1.0 is copied |
| <b>187-192</b> | <b>I6</b> | Data set summary record length<br>= 'bb4096'                                            | The value of Level 1.0 is copied |
| <b>193-198</b> | <b>I6</b> | Number of map projection data records<br>Level 1.1 = 'bbbbbb0'<br>Level 1.5 = 'bbbbbb1' |                                  |
| <b>199-204</b> | <b>I6</b> | Map projection record length<br>Level 1.1 = 'bbbbbb0'<br>Level 1.5 = 'bb1620'           |                                  |
| <b>205-210</b> | <b>I6</b> | Number of platform pos. data records<br>= 'bbbbbb1'                                     | The value of Level 1.0 is copied |
| <b>211-216</b> | <b>I6</b> | Platform position record length<br>= 'bb4680'                                           | The value of Level 1.0 is copied |

# SARLeaderFileDescriptorRecord ( 7 / 12 )

| Bytes   | Format | Description                                                          | Contents                         |
|---------|--------|----------------------------------------------------------------------|----------------------------------|
| 217-222 | I6     | Number of attitude data records<br>= 'bbbbbb1'                       | The value of Level 1.0 is copied |
| 223-228 | I6     | Attitude data record length<br>= 8192                                | The value of Level 1.0 is copied |
| 229-234 | I6     | Number of radiometric data records<br>Level 1.1, 1.5 = 'bbbbbb1'     |                                  |
| 235-240 | I6     | Radiometric record length<br>Level 1.1, 1.5 = 'bb9860'               |                                  |
| 241-246 | I6     | Number of radiometric compensation records<br>= 'bbbbbb0'            | The value of Level 1.0 is copied |
| 247-252 | I6     | Radiometric compensation rec. length<br>= 'bbbbbb0'                  | The value of Level 1.0 is copied |
| 253-258 | I6     | Number of data quality summary records<br>Level 1.1, 1.5 = 'bbbbbb1' |                                  |

# SARLeaderFileDescriptorRecord ( 8 / 12 )

| Bytes          | Format    | Description                                                     | Contents                         |
|----------------|-----------|-----------------------------------------------------------------|----------------------------------|
| <b>259-264</b> | <b>I6</b> | Data quality summary record length<br>Level 1.1, 1.5 = 'bb1620' |                                  |
| <b>265-270</b> | <b>I6</b> | Number of data histograms records<br>= 'bbbbbb0'                | The value of Level 1.0 is copied |
| <b>271-276</b> | <b>I6</b> | Data histogram record length<br>= 'bbbbbb0'                     | The value of Level 1.0 is copied |
| <b>277-282</b> | <b>I6</b> | Number of range spectra records<br>= 'bbbbbb0'                  | The value of Level 1.0 is copied |
| <b>283-288</b> | <b>I6</b> | Range spectra record length<br>= 'bbbbbb0'                      | The value of Level 1.0 is copied |
| <b>289-294</b> | <b>I6</b> | Number of DEM descriptor records<br>= 'bbbbbb0'                 | The value of Level 1.0 is copied |

# SARLeaderFileDescriptorRecord ( 9 / 12 )

| Bytes          | Format    | Description                                        | Contents                         |
|----------------|-----------|----------------------------------------------------|----------------------------------|
| <b>295-300</b> | <b>I6</b> | DEM descriptor record length<br>= 'bbbbbb0'        | The value of Level 1.0 is copied |
| <b>301-306</b> | <b>I6</b> | Number of Radar par. update records<br>= 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>307-312</b> | <b>I6</b> | Radar par. update record length<br>= 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>313-318</b> | <b>I6</b> | Number of Annotation data records<br>= 'bbbbbb0'   | The value of Level 1.0 is copied |
| <b>319-324</b> | <b>I6</b> | Annotation data record length<br>= 'bbbbbb0'       | The value of Level 1.0 is copied |
| <b>325-330</b> | <b>I6</b> | Number of Det. processing records<br>= 'bbbbbb0'   | The value of Level 1.0 is copied |
| <b>331-336</b> | <b>I6</b> | Det. processing record length<br>= 'bbbbbb0'       | The value of Level 1.0 is copied |

SARLeaderFileDescriptorRecord ( 10 / 12 )

| Bytes          | Format      | Description                                                 | Contents                         |
|----------------|-------------|-------------------------------------------------------------|----------------------------------|
| <b>337-342</b> | <b>I6</b>   | Number of Calibration records<br>Level 1.1, 1.5 = 'bbbbbb0' |                                  |
| <b>343-348</b> | <b>I6</b>   | Calibration record length<br>Level 1.1, 1.5 = 'bbbbbb0'     |                                  |
| <b>349-354</b> | <b>I6</b>   | Number of GCP records<br>= 'bbbbbb0'                        | The value of Level 1.0 is copied |
| <b>355-360</b> | <b>I6</b>   | GCP record length<br>= 'bbbbbb0'                            | The value of Level 1.0 is copied |
| <b>361-420</b> | <b>10I6</b> | blanks                                                      | The value of Level 1.0 is copied |

**SARLeaderFileDescriptorRecord ( 11 / 12 )**

| Bytes          | Format    | Description                                    | Contents                         |
|----------------|-----------|------------------------------------------------|----------------------------------|
| <b>421-426</b> | <b>I6</b> | Number of facility data(1) records = 'bbbbbb1' | The value of Level 1.0 is copied |
| <b>427-434</b> | <b>I8</b> | Facility data(1) record length = 'b1540000'    | The value of Level 1.0 is copied |
| <b>435-440</b> | <b>I6</b> | Number of facility data(2) records = 'bbbbbb1' | The value of Level 1.0 is copied |
| <b>441-448</b> | <b>I8</b> | Facility data(2) record length = 'b4314000'    | The value of Level 1.0 is copied |
| <b>449-454</b> | <b>I6</b> | Number of facility data(3) records = 'bbbbbb1' | The value of Level 1.0 is copied |
| <b>455-462</b> | <b>I8</b> | Facility data(3) record length = 'bb345000'    | The value of Level 1.0 is copied |
| <b>463-468</b> | <b>I6</b> | Number of facility data(4) records = 'bbbbbb1' | The value of Level 1.0 is copied |
| <b>469-476</b> | <b>I8</b> | Facility data(4) record length = 'bb325000'    | The value of Level 1.0 is copied |
| <b>477-482</b> | <b>I6</b> | Number of facility data(5) records = 'bbbbbb1' | The value of Level 1.0 is copied |
| <b>483-490</b> | <b>I8</b> | Facility data(5) record length = 'bb325000'    | The value of Level 1.0 is copied |
| <b>491-496</b> | <b>I6</b> | Number of facility data(6) records = 'bbbbbb1' | The value of Level 1.0 is copied |
| <b>497-504</b> | <b>I8</b> | Facility data(6) record length = 'bbbb3072'    | The value of Level 1.0 is copied |

A

**SARLeaderFileDescriptorRecord ( 12 / 12 )**

| Bytes          | Format    | Description                                     | Contents                            |
|----------------|-----------|-------------------------------------------------|-------------------------------------|
| <b>505-510</b> | <b>I6</b> | Number of facility data(7) records = 'bbbbbb1'  | The value of Level 1.0 is copied    |
| <b>511-518</b> | <b>I8</b> | Facility data(7) record length = 'bb511000'     | The value of Level 1.0 is copied    |
| <b>519-524</b> | <b>I6</b> | Number of facility data(8) records = 'bbbbbb1'  | The value of Level 1.0 is copied  A |
| <b>525-532</b> | <b>I8</b> | Facility data(8) record length = 'b4370000'     | The value of Level 1.0 is copied    |
| <b>533-538</b> | <b>I6</b> | Number of facility data(9) records = 'bbbbbb1'  | The value of Level 1.0 is copied    |
| <b>539-546</b> | <b>I8</b> | Facility data(9) record length = 'bb728000'     | The value of Level 1.0 is copied    |
| <b>547-552</b> | <b>I6</b> | Number of facility data(10) records = 'bbbbbb1' | The value of Level 1.0 is copied    |
| <b>553-560</b> | <b>I8</b> | Facility data(10) record length = 'bbb15000'    | The value of Level 1.0 is copied    |
| <b>561-566</b> | <b>I6</b> | Number of facility data(11) records = 'bbbbbb1' |                                     |
| <b>567-574</b> | <b>I8</b> | Facility data(11) record length = 'bbbb1024'    |                                     |
| <b>575-720</b> | <b>CH</b> | blanks                                          | The value of Level 1.0 is copied    |

**DataSetSummaryRecord ( 1 / 21 )**

| Bytes        | Format    | Description                                                    | Contents                         |
|--------------|-----------|----------------------------------------------------------------|----------------------------------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number = 2                                     | The value of Level 1.0 is copied |
| <b>5</b>     | <b>B</b>  | 1st record sub-type code = 18                                  | The value of Level 1.0 is copied |
| <b>6</b>     | <b>B</b>  | Record type code = 10                                          | The value of Level 1.0 is copied |
| <b>7</b>     | <b>B</b>  | 2nd record sub-type code = 18                                  | The value of Level 1.0 is copied |
| <b>8</b>     | <b>B</b>  | 3rd record sub-type code = 20                                  | The value of Level 1.0 is copied |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 4096                                   | The value of Level 1.0 is copied |
| <b>13-16</b> | <b>I4</b> | Data set Summary Record sequence number (starts at 1) = 'bbb1' | The value of Level 1.0 is copied |
| <b>17-20</b> | <b>I4</b> | SAR channel indicator<br>Always blank filled                   | The value of Level 1.0 is copied |

**DataSetSummaryRecord ( 2 / 21 )**

| Bytes          | Format       | Description                                                                                                                                                                                                                                     | Contents                                          |
|----------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| <b>21-52</b>   | <b>CH</b>    | Scene identifier = 'AABBBCDDDDDEEEEEbbbbbbbbbbbbbbbb'<br>where : AA = Satellite ID ('AL')<br>BBB = Sensor ID ('PSR')<br>C = Sensor Sub-ID<br>DDDDD = Orbit accumulation number of a scene center<br>EEEE = Scene frame number of a scene center | The value of Level 1.0 is copied                  |
| <b>53-68</b>   | <b>CH</b>    | Scene designator (Always blank filled)                                                                                                                                                                                                          | The value of Level 1.0 is copied                  |
| <b>69-100</b>  | <b>CH</b>    | Input scene center time = 'YYYYMMDDHHMMSSTTTbbbbbbbbbbbbbb'<br>where : YYYY = year<br>MM = month<br>DD = day<br>HH = hours (00 to 23)<br>MM = minutes (00 to 59)<br>SS = seconds (00 to 59)<br>TTT = milliseconds (000 to 999)                  | In Level 1.1,<br>the value of Level 1.0 is copied |
| <b>101-116</b> | <b>CH</b>    | spare (Always blank filled)                                                                                                                                                                                                                     | The value of Level 1.0 is copied                  |
| <b>117-132</b> | <b>F16.7</b> | Processed scene center geodetic latitude defined as positive to the north of the equator and negative to the south (deg.) (Level 1.5)                                                                                                           | In Level 1.1,<br>the value of Level 1.0 is copied |
| <b>133-148</b> | <b>F16.7</b> | Processed scene center geodetic longitude defined as positive to the east of the prime meridian and negative to the west. (deg.) (Level 1.5)                                                                                                    | In Level 1.1,<br>the value of Level 1.0 is copied |

DataSetSummaryRecord ( 3 / 21 )

| Bytes          | Format       | Description                                                                                 | Contents                                          |
|----------------|--------------|---------------------------------------------------------------------------------------------|---------------------------------------------------|
| <b>149-164</b> | <b>F16.7</b> | Processed Scene Center true heading as calculated relative to true North (deg.) (Level 1.5) | In Level 1.1,<br>the value of Level 1.0 is copied |
| <b>165-180</b> | <b>CH</b>    | Ellipsoid designator<br>= 'GRS80bbbbbbbbbb'                                                 | The value of Level 1.0 is copied                  |
| <b>181-196</b> | <b>F16.7</b> | Ellipsoid semi-major axis (km) -(R) = 6378.1370000                                          | The value of Level 1.0 is copied                  |
| <b>197-212</b> | <b>F16.7</b> | Ellipsoid semi-minor axis (km) = 6356.7523141                                               | The value of Level 1.0 is copied                  |
| <b>213-228</b> | <b>F16.7</b> | Earth's mass -(M) ( $10^{24}$ kg) = 5.9740000                                               | The value of Level 1.0 is copied                  |
| <b>229-244</b> | <b>F16.7</b> | Gravitational constant -(G) ( $10^{14}$ m <sup>3</sup> /s <sup>2</sup> kg)= 3.9860050       | The value of Level 1.0 is copied                  |
| <b>245-260</b> | <b>F16.7</b> | Ellipsoid J2 parameter ( $10^{-2}$ ) = 0.1082629                                            | The value of Level 1.0 is copied                  |
| <b>261-276</b> | <b>F16.7</b> | Ellipsoid J3 parameter ( $10^{-1}$ )= -0.0000254                                            | The value of Level 1.0 is copied                  |
| <b>277-292</b> | <b>F16.7</b> | Ellipsoid J4 parameter ( $10^{-1}$ ) = -0.0000162                                           | The value of Level 1.0 is copied                  |
| <b>293-308</b> | <b>CH</b>    | spare (Always blank filled)                                                                 | The value of Level 1.0 is copied                  |

**DataSetSummaryRecord ( 4 / 21 )**

| Bytes          | Format       | Description                                                                                                                                                                                                                      | Contents                         |
|----------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>309-324</b> | <b>F16.7</b> | Average terrain height above Ellipsoid at scene center (km) (Always blank filled)                                                                                                                                                | The value of Level 1.0 is copied |
| <b>325-332</b> | <b>I8</b>    | Scene center line number (the line no. at the scene center including zero fill)                                                                                                                                                  |                                  |
| <b>333-340</b> | <b>I8</b>    | Scene center pixel number (the pixel number at the scene center including zero fill)                                                                                                                                             |                                  |
| <b>341-356</b> | <b>F16.7</b> | Processed scene length (km) including zero fill (Always blank filled)                                                                                                                                                            | The value of Level 1.0 is copied |
| <b>357-372</b> | <b>F16.7</b> | Processed scene width (km) including zero fill (Always blank filled)                                                                                                                                                             | The value of Level 1.0 is copied |
| <b>373-388</b> | <b>CH</b>    | spare (Always blank filled)                                                                                                                                                                                                      | The value of Level 1.0 is copied |
| <b>389-392</b> | <b>I4</b>    | Number of SAR channels<br>1: In case of High Resolution Mode(Single-Polarization),<br>Direct Down link Mode and Wide Observation Mode<br>2: In case of High Resolution Mode(Dual-Polarization)<br>4: In case of Polarimetry Mode | The value of Level 1.0 is copied |
| <b>393-396</b> | <b>CH</b>    | spare (Always blank filled)                                                                                                                                                                                                      | The value of Level 1.0 is copied |
| <b>397-412</b> | <b>CH</b>    | Sensor platform mission identifier<br>ALOS : 'ALOSbbbbbbbbbbbb'                                                                                                                                                                  | The value of Level 1.0 is copied |

**DataSetSummaryRecord ( 5 / 21 )**

| Bytes          | Format      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Contents                                          |
|----------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| <b>413-444</b> | <b>CH</b>   | <p>Sensor ID: and mode of operation for this channel = 'AAAAAA-BB-CCDE-bbbbbbbbbbbbbbbb'<br/>           where AAAAAA = Mission name (ALOS : 'ALOSbb' )<br/>           BB = SAR band (ALOS : 'Lb')<br/>           CC = Code for resolution mode ('Hb', 'Lb')<br/>           (Except Wide Observation Mode = 'Hb', Wide Observation Mode = 'Lb')<br/>           DE : Code for imaging mode<br/>           D : PALSAR mode (Stand-by 4 = '3', Calibration mode = '4',<br/>           Standby for observation='5', Observation mode = '6')<br/>           Extracted from Auxiliary data of first PALSAR frame<br/>           E : PALSAR Sub-mode<br/>           In case of D = PALSAR mode is '4'or '5'<br/>           Noise3 = '0', Monitor of Tx Power = '1', Monitor of Tx wave = '2', REV of Rx = '3',<br/>           Special characteristic for total Rx = '4', REV of Tx = '5', Special characteristic for total Tx = '6',<br/>           IN/OUT for Rx = '7', Special characteristic for ATT of Rx = '8',<br/>           Special characteristic for frequency of Rx = '9', Noise1 = '10',Noise2 = '11'<br/>           In case of D = PALSAR mode is '6'<br/>           High resolution mode = '0',Wide observation = '1', Polarimetry mode = '2', Direct downlink mode = '3'<br/>           Extracted from Auxiliary data of first PALSAR frame</p> | The value of Level 1.0 is copied                  |
| <b>445-452</b> | <b>I8</b>   | Orbit number or flight line indicator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | The value of Level 1.0 is copied                  |
| <b>453-460</b> | <b>F8.3</b> | Sensor Platform geodetic Latitude at nadir corresponding to Scene Center<br>(degrees) (Level 1.5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | In Level 1.1,<br>the value of Level 1.0 is copied |
| <b>461-468</b> | <b>F8.3</b> | Sensor Platform geodetic Longitude at nadir corresponding to Scene Center<br>(degrees) (Level 1.5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | In Level 1.1,<br>the value of Level 1.0 is copied |

F  
H

DataSetSummaryRecord ( 6 / 21 )

| Bytes          | Format       | Description                                                                                                                                                                | Contents                                                        |
|----------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>469-476</b> | <b>F8.3</b>  | Sensor Platform Heading at nadir corresponding to Scene Center (degrees) (Level 1.5)                                                                                       | In Level 1.1,<br>the value of Level 1.0 is copied               |
| <b>477-484</b> | <b>F8.3</b>  | Sensor clock angle as measured relative to sensor platform flight direction (degrees)<br>(i.e.: -90:0=left pointing, and +90:0=right pointing) = always 'bb90.000'         | The value of Level 1.0 is copied                                |
| <b>485-492</b> | <b>F8.3</b>  | Incidence angle at scene center as derived from sensor platform<br>orientation, electronic boresight and Earth's geometry (Level1.1, Level1.5 Geo-reference)               | In Level 1.5 and Geo-coded,<br>the value of Level 1.0 is copied |
| <b>493-500</b> | <b>CH</b>    | spare (Always blank filled)                                                                                                                                                | The value of Level 1.0 is copied                                |
| <b>501-516</b> | <b>F16.7</b> | Radar wavelength (meters) = Nominal value                                                                                                                                  | The value of Level 1.0 is copied                                |
| <b>517-518</b> | <b>CH</b>    | Motion compensation indicator = Always '00'<br>00 : no compensation<br>01 : on board compensation<br>10 : in processor compensation<br>11 : both on board and in processor | The value of Level 1.0 is copied                                |
| <b>519-534</b> | <b>CH</b>    | Range pulse code specifier = 'LINEARbFMbCHIRPb'<br>(e.g.: 'LINEARbFMbCHIRPb', 'PHASEbMODULATORb', etc.)                                                                    | The value of Level 1.0 is copied                                |

|A

**DataSetSummaryRecord ( 7 / 21 )**

| Bytes          | Format       | Description                                                                                                     | Contents                         |
|----------------|--------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>535-550</b> | <b>E16.7</b> | Range pulse amplitude coefficient #1 = Nominal value<br>(Chirp range chirp constant term (offset from DC) (Hz)) | The value of Level 1.0 is copied |
| <b>551-566</b> | <b>E16.7</b> | Range pulse amplitude coefficient #2 = Nominal value<br>(Chirp = range chirp linear term (Hz/sec))              | The value of Level 1.0 is copied |
| <b>567-582</b> | <b>E16.7</b> | Range pulse amplitude coefficient #3 = Nominal value<br>(quadratic term)                                        | The value of Level 1.0 is copied |
| <b>583-598</b> | <b>E16.7</b> | Range pulse amplitude coefficient #4 = Nominal value<br>(cubic term)                                            | The value of Level 1.0 is copied |
| <b>599-614</b> | <b>E16.7</b> | Range pulse amplitude coefficient #5 = Nominal value<br>(fourth term)                                           | The value of Level 1.0 is copied |

DataSetSummaryRecord ( 8 / 21 )

| Bytes          | Format       | Description                                                                                                                         | Contents                         |
|----------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>615-630</b> | <b>E16.7</b> | Range pulse phase coefficient #1 (offset in radians) (Always blank filled)                                                          | The value of Level 1.0 is copied |
| <b>631-646</b> | <b>E16.7</b> | Range pulse phase coefficient #2 (linear term in rads./sec) (Always blank filled)                                                   | The value of Level 1.0 is copied |
| <b>647-662</b> | <b>E16.7</b> | Range pulse phase coefficient #3 (quadratic term in rads./sec') (Always blank filled)                                               | The value of Level 1.0 is copied |
| <b>663-678</b> | <b>E16.7</b> | Range pulse phase coefficient #4 (cubic term) (Always blank filled)                                                                 | The value of Level 1.0 is copied |
| <b>679-694</b> | <b>E16.7</b> | Range pulse phase coefficient #5 (quadratic term) (Always blank filled)                                                             | The value of Level 1.0 is copied |
| <b>695-702</b> | <b>I8</b>    | Down linked data chirp extraction index (in samples) = 'bbbbbbb1'<br>linear-down chirp = 'bbbbbbb1'<br>linear-up chirp = 'bbbbbbb0' |                                  |
| <b>703-710</b> | <b>CH</b>    | spare (Always blank filled)                                                                                                         | The value of Level 1.0 is copied |
| <b>711-726</b> | <b>F16.7</b> | Sampling rate (MHz)<br>Extracted from Auxiliary data of first PALSAR frame.                                                         | The value of Level 1.0 is copied |
| <b>727-742</b> | <b>F16.7</b> | Range gate at early edge (in time) at the start of the image (micro-sec)<br>Extracted from Auxiliary data of first PALSAR frame.    | The value of Level 1.0 is copied |
| <b>743-758</b> | <b>F16.7</b> | Range pulse length (micro-sec)<br>Extracted from Auxiliary data of first PALSAR frame.                                              | The value of Level 1.0 is copied |
| <b>759-762</b> | <b>CH</b>    | Base band conversion flag (YESb/NOTb) (YES = base band converted)                                                                   | The value of Level 1.0 is copied |

A

DataSetSummaryRecord ( 9 / 21 )

| Bytes          | Format        | Description                                                                                    | Contents                         |
|----------------|---------------|------------------------------------------------------------------------------------------------|----------------------------------|
| <b>763-766</b> | <b>CH</b>     | Range compressed flag (YESb/NOTb) (YES = range compressed)<br>Level 1.1, 1.5 = 'YESb'          |                                  |
| <b>767-782</b> | <b>F16.7</b>  | Receiver gain for like polarized at early edge at the start of the image (dB) = Nominal value  | The value of Level 1.0 is copied |
| <b>783-798</b> | <b>F16.7</b>  | Receiver gain for cross polarized at early edge at the start of the image (dB) = Nominal value | The value of Level 1.0 is copied |
| <b>799-806</b> | <b>I8</b>     | Quantization in bits per channel<br>= 'bbbbbbb3', 'bbbbbbb5'                                   | The value of Level 1.0 is copied |
| <b>807-818</b> | <b>CH</b>     | Quantizer descriptor (e.g.: 'UNIFORMbI,Qb') = 'UNIFORMbI,Qb'                                   | The value of Level 1.0 is copied |
| <b>819-834</b> | <b>F16.7</b>  | DC Bias for I-component = Nominal value                                                        | The value of Level 1.0 is copied |
| <b>835-850</b> | <b>F16.7</b>  | DC Bias for Q-component = Nominal value                                                        | The value of Level 1.0 is copied |
| <b>851-866</b> | <b>F16.7</b>  | Gain imbalance for I & Q = Nominal value                                                       | The value of Level 1.0 is copied |
| <b>867-898</b> | <b>2F16.7</b> | spare (Always blank filled)                                                                    | The value of Level 1.0 is copied |

DataSetSummaryRecord ( 10 / 21 )

| Bytes            | Format       | Description                                                                                                                                      | Contents                         |
|------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>899-914</b>   | <b>F16.7</b> | Antenna electronic boresight relative to platform vertical axis at the start of the image (degrees)                                              | The value of Level 1.0 is copied |
| <b>915-930</b>   | <b>F16.7</b> | Antenna mechanical boresight relative to platform vertical axis at the start of the image, positive to the right, negative to the left (degrees) | The value of Level 1.0 is copied |
| <b>931-934</b>   | <b>CH</b>    | Echo tracker-on/off designator ('Onbb', or 'OFFb')                                                                                               | The value of Level 1.0 is copied |
| <b>935-950</b>   | <b>F16.7</b> | Nominal PRF (mHz)<br>Inverse of PRT extracted from Auxiliary data of first PALSAR frame.                                                         | The value of Level 1.0 is copied |
| <b>951-966</b>   | <b>F16.7</b> | Effective two-way antenna elevation 3dB beam width at boresight (degrees) (Nominal value)                                                        | The value of Level 1.0 is copied |
| <b>967-982</b>   | <b>F16.7</b> | Effective two-way antenna azimuth 3dB beam width at electronic boresight (degrees) (Nominal value)                                               | The value of Level 1.0 is copied |
| <b>983-998</b>   | <b>I16</b>   | Satellite encoded binary time code                                                                                                               | The value of Level 1.0 is copied |
| <b>999-1030</b>  | <b>CH</b>    | Satellite clock time                                                                                                                             | The value of Level 1.0 is copied |
| <b>1031-1046</b> | <b>I16</b>   | Satellite clock increment (nsec)                                                                                                                 | The value of Level 1.0 is copied |

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**DataSetSummaryRecord ( 11 / 21 )**

| Bytes            | Format    | Description                                                                                    | Contents                         |
|------------------|-----------|------------------------------------------------------------------------------------------------|----------------------------------|
| <b>1047-1062</b> | <b>CH</b> | Processing facility identifier = 'EOC-ALOS-DPSbbbb'                                            | The value of Level 1.0 is copied |
| <b>1063-1070</b> | <b>CH</b> | Processing system identifier = 'ALOS-DPS'                                                      | The value of Level 1.0 is copied |
| <b>1071-1078</b> | <b>CH</b> | Processing version identifier<br>Note: This is the same as software release and revision level | The value of Level 1.0 is copied |
| <b>1079-1094</b> | <b>CH</b> | Processing facility process code = 'bbbbbbbbbbbbbbbb'                                          | The value of Level 1.0 is copied |
| <b>1095-1110</b> | <b>CH</b> | Product level code<br>Level 1.1 = '1.bbbbbbbbbbbbb'                                            | The value of Level 1.0 is copied |
|                  |           | Level 1.5 = '1.5bbbbbbbbbbbb'                                                                  |                                  |
| <b>1111-1142</b> | <b>CH</b> | Product type specifier<br>Level 1.1 = 'BASICbIMAGEbbbbbbbbbbbbbbbb'                            |                                  |
|                  |           | Level 1.5 = 'STANDARDbGEOCODEDbIMAGEbbbbbbbb'                                                  |                                  |
| <b>1143-1174</b> | <b>CH</b> | Processing algorithm identifier = 'bbbbbbbbbbbbbbbb'                                           | The value of Level 1.0 is copied |

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DataSetSummaryRecord ( 12 / 21 )

| Bytes            | Format       | Description                                                                                                                                                                                                                                                                                                                                                                                                                      | Contents |
|------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>1175-1190</b> | <b>F16.7</b> | Nominal effective number of looks processed in Azimuth<br>Level 1.1 = 1.0<br>Level 1.5, High resolution mode (Single-Polarization), Pixel spacing 6.25 meter = 2.0<br>Pixel spacing 12.5 meter = 4.0<br>(Dual-Polarization), Pixel spacing 12.5 meter = 4.0<br>Direct Down link Mode, Pixel spacing 12.5 meter = 4.0<br>Wide Observation Mode, Pixel spacing 100 meter = 8.0<br>Polarimetry Mode, Pixel spacing 12.5 meter = 4.0 |          |
| <b>1191-1206</b> | <b>F16.7</b> | Nominal effective number of looks processed in Range = 1.0                                                                                                                                                                                                                                                                                                                                                                       |          |
| <b>1207-1222</b> | <b>F16.7</b> | Bandwidth per look in Azimuth (Hz) $B_A$<br>Same value as 1239-1254 bytes                                                                                                                                                                                                                                                                                                                                                        |          |
| <b>1223-1238</b> | <b>F16.7</b> | Bandwidth per look in Range (Hz)                                                                                                                                                                                                                                                                                                                                                                                                 |          |
| <b>1239-1254</b> | <b>F16.7</b> | Total processor bandwidth in Azimuth (Hz)<br>Wide Observation Mode : blank                                                                                                                                                                                                                                                                                                                                                       |          |
| <b>1255-1270</b> | <b>F16.7</b> | Total processor bandwidth in Range (kHz)                                                                                                                                                                                                                                                                                                                                                                                         |          |

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**DataSetSummaryRecord ( 13 / 21 )**

| Bytes            | Format       | Description                                                                     | Contents                                                        |
|------------------|--------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>1271-1302</b> | <b>CH</b>    | Weighing function designator in Azimuth = 1 (*1)                                | (*1)<br>1:RECTANGLE                                             |
| <b>1303-1334</b> | <b>CH</b>    | Weighing function designator in Range = 1 (*1)                                  |                                                                 |
| <b>1335-1350</b> | <b>CH</b>    | Data input source (e.g.: HDDT identifier)<br>Online = 'ONLINEbbbbbbbbbb'        | The value of Level 1.0 is copied                                |
| <b>1351-1366</b> | <b>F16.7</b> | Nominal resolution equal to 3dB points in ground range (meter)                  | In Level 1.1,<br>the value of Level 1.0 is copied               |
| <b>1367-1382</b> | <b>F16.7</b> | Nominal resolution in Azimuth (meter)                                           | In Level 1.1,<br>the value of Level 1.0 is copied               |
| <b>1383-1398</b> | <b>F16.7</b> | Constant radiometric parameter (Bias) = Always blank filled                     | The value of Level 1.0 is copied                                |
| <b>1399-1414</b> | <b>F16.7</b> | Linear radiometric parameter (Gain) = Always blank filled                       | The value of Level 1.0 is copied                                |
| <b>1415-1430</b> | <b>F16.7</b> | Along track Doppler frequency constant term at early edge of image (Hz)         | In Level 1.5 and Geo-coded,<br>the value of Level 1.0 is copied |
| <b>1431-1446</b> | <b>F16.7</b> | Along track Doppler frequency linear term at early edge of the image (Hz/pixel) | In Level 1.5 and Geo-coded,<br>the value of Level 1.0 is copied |

A

**DataSetSummaryRecord ( 14 / 21 )**

| Bytes            | Format       | Description                                                                                                    | Contents                                                     |
|------------------|--------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| <b>1447-1462</b> | <b>F16.7</b> | Along track Doppler frequency quadratic term at early edge of the image (Hz/pixel/pixel)                       | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |
| <b>1463-1478</b> | <b>CH</b>    | spare (Always blank filled)                                                                                    | The value of Level 1.0 is copied                             |
| <b>1479-1494</b> | <b>F16.7</b> | Cross track Doppler frequency constant term at early edge of the image (Hz)                                    | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |
| <b>1495-1510</b> | <b>F16.7</b> | Cross track Doppler frequency linear term at early edge of the image (Hz/pixel)                                | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |
| <b>1511-1526</b> | <b>F16.7</b> | Cross track Doppler frequency quadratic term at early edge of the image (Hz/pixel/pixel) = 0.0                 | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |
| <b>1527-1534</b> | <b>CH</b>    | Time direction indicator along pixel direction = Always blank filled (i.e. 'INCREASE' -ing or 'DECREASE' -ing) | The value of Level 1.0 is copied                             |
| <b>1535-1542</b> | <b>CH</b>    | Time direction indicator along line direction<br>Ascending node = 'ASCENDbb'<br>Descending node = 'DESCENDb'   | The value of Level 1.0 is copied                             |
| <b>1543-1558</b> | <b>F16.7</b> | Along track Doppler frequency rate constant term at early edge of the image (Hz/sec)                           | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |

**DataSetSummaryRecord ( 15 / 21 )**

| Bytes            | Format       | Description                                                                                                     | Contents                                                     |
|------------------|--------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| <b>1559-1574</b> | <b>F16.7</b> | Along track Doppler frequency rate 1 linear term at early edge of the image (Hz/sec/pixel)                      | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |
| <b>1575-1590</b> | <b>F16.7</b> | Along track Doppler frequency rate quadratic term at early edge of the image (Hz/sec/pixel/pixel) = 0.0         | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |
| <b>1591-1606</b> | <b>CH</b>    | spare (Always blank filled)                                                                                     | The value of Level 1.0 is copied                             |
| <b>1607-1622</b> | <b>F16.7</b> | Cross track Doppler frequency rate constant term at near edge of the image (Hz/sec)                             | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |
| <b>1623-1638</b> | <b>F16.7</b> | Cross track Doppler frequency rate linear term relative to near edge of the image (Hz/sec/pixel)                | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |
| <b>1639-1654</b> | <b>F16.7</b> | Cross track Doppler frequency rate quadratic term relative to near edge of the image (Hz/sec/pixel/pixel) = 0.0 | In Level 1.5 and Geo-coded, the value of Level 1.0 is copied |
| <b>1655-1670</b> | <b>CH</b>    | spare (Always blank filled)                                                                                     | The value of Level 1.0 is copied                             |

DataSetSummaryRecord ( 16 / 21 )

| Bytes            | Format       | Description                                                                                                                         | Contents |
|------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>1671-1678</b> | <b>CH</b>    | Line content indicator (e.g.: 'RANGEbbb', 'AZIMUTHb' or 'OTHERbbb')<br>Level 1.1 = 'RANGEbbb'<br>Level 1.5 = 'OTHERbbb'             |          |
| <b>1679-1682</b> | <b>CH</b>    | Clutter lock applied flag ('YESb' / 'NOTb')<br>Level 1.1, Level 1.5 = 'YESb'                                                        |          |
| <b>1683-1686</b> | <b>CH</b>    | Auto-focusing applied flag ('YESb' / 'NOTb')<br>Level 1.1, Level 1.5 = 'NOTb'                                                       |          |
| <b>1687-1702</b> | <b>F16.7</b> | Line spacing (meter)<br>Level 1.5 = 6.25 / 12.5 / 100.0<br>Level 1.1 = Calculated azimuth spacing                                   |          |
| <b>1703-1718</b> | <b>F16.7</b> | Pixel spacing (meter)<br>Level 1.5 = 6.25 / 12.5 / 100.0<br>Level 1.1 = Calculated range spacing                                    |          |
| <b>1719-1734</b> | <b>CH</b>    | Processor range compression designator<br>( 'SYNTHETICbCHIRPb' or 'EXTRACTEDbCHIRPb' )<br>Level 1.1, Level 1.5 = 'EXTRACTEDbCHIRPb' |          |

|F

|I

|I

DataSetSummaryRecord ( 17 / 21 )

| Bytes     | Format | Description                                                                                                                                 | Contents |
|-----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 1735-1750 | F16.7  | Doppler center frequency constant term (a)                                                                                                  |          |
| 1751-1766 | F16.7  | Doppler center frequency linear term (b)<br><br>$fd = a + b R$<br>where fd : Doppler center frequency (Hz)<br>R : Slant range ( <u>km</u> ) |          |

|C

**DataSetSummaryRecord ( 18 / 21 )**

| Bytes            | Format    | Description                                                                                                                                                                                                                                                                                                                         | Contents                                                                                  |
|------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>1767-1770</b> | <b>I4</b> | <p>SENSOR SPECIFIC LOCAL USE SEGMENT</p> <p>Calibration data indicator<br/> no calibration data = 'bbb0'<br/> including calibration data at the edge of upper image = 'bbb1'<br/> including calibration data at the edge of lower image = 'bbb2'<br/> including calibration data at the edges of upper and lower image = 'bbb3'</p> | <p>The value of Level 1.0 is copied<br/> Set at the facility related (11) data record</p> |
| <b>1771-1778</b> | <b>I8</b> | <p>Start line number of calibration at upper image<br/> In case of no calibration data, always = bbbbbb0'</p>                                                                                                                                                                                                                       |                                                                                           |
| <b>1779-1786</b> | <b>I8</b> | <p>Stop line number of calibration at upper image<br/> In case of no calibration data, always = bbbbbb0'</p>                                                                                                                                                                                                                        |                                                                                           |
| <b>1787-1794</b> | <b>I8</b> | <p>Start line number of calibration at bottom image<br/> In case of no calibration data, always = bbbbbb0'</p>                                                                                                                                                                                                                      |                                                                                           |
| <b>1795-1802</b> | <b>I8</b> | <p>Stop line number of calibration at bottom image<br/> In case of no calibration data, always = bbbbbb0'</p>                                                                                                                                                                                                                       |                                                                                           |

DataSetSummaryRecord ( 19 / 21 )

| Bytes     | Format | Description                                                                                                                              | Contents                                                                         |
|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| 1803-1806 | I4     | PRF switching indicator<br>a fixed PRF = 'bbb0'<br>variable PRFs except Wide observation mode = 'bbb1'<br>Wide observation mode = 'bbb1' | The value of Level 1.0 is copied<br>Set at the facility related (11) data record |
| 1807-1814 | I8     | Line locator of PRF switching<br>a fixed PRF = 'bbbbbbb1'<br>Wide observation mode = 'bbbbbbb0'                                          |                                                                                  |
| 1815-1830 | F16.7  | The direction of a beam center in a scene center (degree)                                                                                | In Level 1.5 and Geo-coded,<br>the value of Level 1.0 is copied                  |
| 1831-1834 | I4     | Yew Steering mode flag<br>No yew Steering mode = 'bbb1'<br>Yew Steering mode = 'bbb0'                                                    | The value of Level 1.0 is copied                                                 |
| 1835-1838 | I4     | Parameter table number of automatically setting = 'bbb0' - 'b191'                                                                        | The value of Level 1.0 is copied                                                 |
| 1839-1854 | F16.7  | Nominal offnadir angle                                                                                                                   | The value of Level 1.0 is copied                                                 |
| 1855-1858 | I4     | Antenna beam number = 'bbb0' - 'bb22'                                                                                                    | The value of Level 1.0 is copied                                                 |
| 1859-1886 | CH     | spare (Always blank filled)                                                                                                              | The value of Level 1.0 is copied                                                 |

DataSetSummaryRecord ( 20 / 21 )

| Bytes                                                                                                                                           | Format        | Description                         | Contents                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------|-----------------------------------------------------------------|
| <b>1887-1906</b>                                                                                                                                | <b>E20.13</b> | Incidence angle constant term (a0)  | In Level 1.5 and Geo-coded,<br>the value of Level 1.0 is copied |
| <b>1907-1926</b>                                                                                                                                | <b>E20.13</b> | Incidence angle linear term (a1)    |                                                                 |
| <b>1927-1946</b>                                                                                                                                | <b>E20.13</b> | Incidence angle quadratic term (a2) |                                                                 |
| <b>1947-1966</b>                                                                                                                                | <b>E20.13</b> | Incidence angle cubic term (a3)     |                                                                 |
| <b>1967-1986</b>                                                                                                                                | <b>E20.13</b> | Incidence angle fourth term (a4)    |                                                                 |
| <b>1987-2006</b>                                                                                                                                | <b>E20.13</b> | Incidence angle fifth term (a5)     |                                                                 |
| $\text{theta} = a_0 + a_1 R + a_2 R^2 + a_3 R^3 + a_4 R^4 + a_5 R^5$ <p>where theta : Incidence angle (rad)<br/>R : Slant range (<u>km</u>)</p> |               |                                     |                                                                 |

|F

DataSetSummaryRecord ( 21 / 21 )

| Bytes     | Format        | Description                                                                          | Contents                         |
|-----------|---------------|--------------------------------------------------------------------------------------|----------------------------------|
|           |               | IMAGE ANNOTATION FIELDS                                                              |                                  |
| 2007-2014 | I8            | Number of Annotation Points (up to 64) = 'bbbbbbb0'                                  | The value of Level 1.0 is copied |
| 2015-2022 | CH            | spare (Always blank filled)                                                          | The value of Level 1.0 is copied |
| 2023-2030 | I8            | Line Number of 1st Annotation start = Always blank filled                            | The value of Level 1.0 is copied |
| 2031-2038 | I8            | Pixel Number of 1st Annotation start = Always blank filled                           | The value of Level 1.0 is copied |
| 2039-2054 | CH            | 1st Annotation Text (e.g.: lat., long. as 'Nnn.nn, W-nnn.nnb') = Always blank filled | The value of Level 1.0 is copied |
| 2055-4070 | (I8*2, CH)*63 | 2nd - 64th Annotation = Always blank filled                                          | The value of Level 1.0 is copied |
| 4071-4072 | CH            | spare (Always blank filled)                                                          | The value of Level 1.0 is copied |
| 4073-4096 | CH            | system reserve                                                                       |                                  |

# MapProjectionDataRecord ( 1 / 12 )

| Bytes        | Format    | Description                   | Contents |
|--------------|-----------|-------------------------------|----------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number = 3    |          |
| <b>5</b>     | <b>B</b>  | 1st record sub-type code = 18 |          |
| <b>6</b>     | <b>B</b>  | Record type code = 20         |          |
| <b>7</b>     | <b>B</b>  | 2nd record sub-type code = 18 |          |
| <b>8</b>     | <b>B</b>  | 3rd record sub-type code = 20 |          |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 1620  |          |
| <b>13-28</b> | <b>CH</b> | blanks                        |          |

# MapProjectionDataRecord ( 2 / 12 )

| Bytes        | Format     | Description                                                                                 | Contents |
|--------------|------------|---------------------------------------------------------------------------------------------|----------|
|              |            | MAP PROJECTION GENERAL INFORMATION                                                          |          |
| <b>29-60</b> | <b>CH</b>  | Map projection descriptor (e.g.: slant range, ground range, geocoded)<br>= 'GEOCODEDb - bb' |          |
| <b>61-76</b> | <b>I16</b> | Number of pixels per line of image                                                          |          |
| <b>77-92</b> | <b>I16</b> | Number of lines                                                                             |          |

# MapProjectionDataRecord ( 3 / 12 )

| Bytes          | Format       | Description                                                                                                                                                                                                                          | Contents |
|----------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>93-108</b>  | <b>F16.7</b> | Nominal inter-pixel distance in output scene (meters) = 6.25 / 12.5 / 100.0                                                                                                                                                          |          |
| <b>109-124</b> | <b>F16.7</b> | Nominal inter-line distance in output scene (meters) = 6.25 / 12.5 / 100.0                                                                                                                                                           |          |
| <b>125-140</b> | <b>F16.7</b> | Orientation at output scene centre,<br>for geocoded products this is simply the convergence of the meridians,<br>i.e.: the angle between geographic north and map grid north (degrees)<br>(Angle of projection axis from true North) |          |
| <b>141-156</b> | <b>F16.7</b> | Actual platform orbital inclination (degrees) = 0.0000000                                                                                                                                                                            |          |
| <b>157-172</b> | <b>F16.7</b> | Actual ascending node (longitude at equator) (degrees) = 0.0000000                                                                                                                                                                   |          |
| <b>173-188</b> | <b>F16.7</b> | Distance of platform at input scene centre from the geocentre (meters)                                                                                                                                                               |          |
| <b>189-204</b> | <b>F16.7</b> | Geodetic altitude of the platform relative to the ellipsoid (meters)                                                                                                                                                                 |          |
| <b>205-220</b> | <b>F16.7</b> | Actual ground speed at nadir at input scene centre time (meters/sec)                                                                                                                                                                 |          |
| <b>221-236</b> | <b>F16.7</b> | Platform heading (degrees):<br>effective subplatform track direction angle relative to true north,<br>including the effects of orbital inclination and skew due to earth rotation                                                    |          |

MapProjectionDataRecord ( 4 / 12 )

| Bytes          | Format       | Description                                                                    | Contents |
|----------------|--------------|--------------------------------------------------------------------------------|----------|
| <b>237-268</b> | <b>CH</b>    | PROJECTION ELLIPSOID PARAMETERS<br>Name of reference ellipsoid = 'GRS80b - bb' |          |
| <b>269-284</b> | <b>F16.7</b> | Semimajor axis of ref. ellipsoid (meters) = 6378137.0000000                    |          |
| <b>285-300</b> | <b>F16.7</b> | Semiminor axis of ref. ellipsoid (meters) = 6356752.3141000                    |          |
| <b>301-316</b> | <b>F16.7</b> | Datum shift parameter referenced to Greenwich: dx (meters) = 0.0000000         |          |
| <b>317-332</b> | <b>F16.7</b> | Datum shift parameter perpendicular to Greenwich: dy (meters) = 0.0000000      |          |
| <b>333-348</b> | <b>F16.7</b> | Datum shift parameter direction of the rotation: dz (meters) = 0.0000000       |          |
| <b>349-364</b> | <b>F16.7</b> | Additional datum shift parameter 1st rotation angle = 0.0000000                |          |
| <b>365-380</b> | <b>F16.7</b> | Additional datum shift parameter 2nd rotation angle = 0.0000000                |          |
| <b>381-396</b> | <b>F16.7</b> | Additional datum shift parameter 3rd rotation angle = 0.0000000                |          |
| <b>397-412</b> | <b>F16.7</b> | Scale factor of reference ellipsoid = 0.0000000                                |          |

MapProjectionDataRecord ( 5 / 12 )

| Bytes          | Format    | Description                                                                                                                                                           | Contents |
|----------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>413-444</b> | <b>CH</b> | <p>MAP PROJECTION DESIGNATOR</p> <p>Alphanumeric description of Map projection<br/> 'UTM-PROJECTION' or 'UPS-PROJECTION',<br/> 'MER-PROJECTION', 'LCC-PROJECTION'</p> |          |

# MapProjectionDataRecord ( 6 / 12 )

| Bytes   | Format | Description                                                                                                   | Contents |
|---------|--------|---------------------------------------------------------------------------------------------------------------|----------|
|         |        | UTM-PROJECTION (1st default)                                                                                  |          |
| 445-476 | CH     | UTM descriptor = 'UNIVERSAL TRANSVERSE MERCATORb - b'                                                         |          |
| 477-480 | CH     | Signature of the UTM zone                                                                                     |          |
| 481-496 | F16.5  | Map origin (false easting) (meters) = 500000.00000                                                            |          |
| 497-512 | F16.5  | Map origin (false northing) (meters)<br>Northern Hemisphere = 0.00000<br>Southern Hemisphere = 10000000.00000 |          |
| 513-528 | F16.7  | Centre of projection longitude (deg)                                                                          |          |
| 529-544 | F16.7  | Centre of projection latitude (deg)                                                                           |          |
| 545-560 | CH     | 1st standard parallel (deg) = blanks                                                                          |          |
| 561-576 | CH     | 2nd standard parallel (deg) = blanks                                                                          |          |
| 577-592 | F16.7  | Scale factor = 0.9996000                                                                                      |          |

blanks except UTM

|G

# MapProjectionDataRecord ( 7 / 12 )

| Bytes          | Format       | Description                                           | Contents          |
|----------------|--------------|-------------------------------------------------------|-------------------|
| <b>593-624</b> | <b>CH</b>    | UPS-PROJECTION (2nd default)                          | blanks except UPS |
|                |              | UPS descriptor = 'UNIVERSAL POLAR STEREOGRAPHICb - b' |                   |
| <b>625-640</b> | <b>F16.7</b> | Centre of projection longitude (deg)                  |                   |
| <b>641-656</b> | <b>F16.7</b> | Centre of projection latitude (deg)                   |                   |
| <b>657-672</b> | <b>F16.7</b> | Scale factor                                          |                   |

|G

# MapProjectionDataRecord ( 8 / 12 )

| Bytes          | Format       | Description                                                                                                                                                 | Contents                                |
|----------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <b>673-704</b> | <b>CH</b>    | NATIONAL SYSTEMS PROJECTION (any other)<br><br>Projection descriptor<br>MER-PROJECTION = 'MERCATORb - b'<br>LCC-PROJECTION = 'LAMBERT-CONFORMAL CONICb - b' |                                         |
| <b>705-720</b> | <b>F16.7</b> | Map origin (false easting) (meters) = blanks                                                                                                                |                                         |
| <b>721-736</b> | <b>F16.7</b> | Map origin (false northing) (meters) = blanks                                                                                                               |                                         |
| <b>737-752</b> | <b>F16.7</b> | Centre of projection longitude (deg)                                                                                                                        | Set up map origin (latitude, longitude) |
| <b>753-768</b> | <b>F16.7</b> | Centre of projection latitude (deg)                                                                                                                         |                                         |
| <b>769-784</b> | <b>F16.7</b> | Standard parallels (deg)<br>MER-PROJECTION = blanks<br>LCC-PROJECTION = Standard parallels fai-1                                                            | blanks except MER, LCC                  |
| <b>785-800</b> | <b>F16.7</b> | Standard parallels (deg)<br>MER-PROJECTION = blanks<br>LCC-PROJECTION = Standard parallels fai-2                                                            |                                         |

|G

MapProjectionDataRecord ( 9 / 12 )

| Bytes          | Format       | Description                       | Contents |
|----------------|--------------|-----------------------------------|----------|
| <b>801-816</b> | <b>F16.7</b> | Standard parallels (deg) = blanks |          |
| <b>817-832</b> | <b>F16.7</b> | Standard parallels (deg) = blanks |          |
| <b>833-848</b> | <b>F16.7</b> | Central meridian (deg) = blanks   |          |
| <b>849-864</b> | <b>F16.7</b> | Central meridian (deg) = blanks   |          |
| <b>865-880</b> | <b>F16.7</b> | Central meridian (deg) = blanks   |          |
| <b>881-944</b> | <b>CH</b>    | blanks                            |          |

## MapProjectionDataRecord ( 10 / 12 )

| Bytes            | Format       | Description                                   | Contents                     |
|------------------|--------------|-----------------------------------------------|------------------------------|
|                  |              | COORDINATES OF FOUR CORNER POINTS             |                              |
| <b>945-960</b>   | <b>F16.7</b> | Top left corner northing (*) (kilometers)     | * set the X coordinate value |
| <b>961-976</b>   | <b>F16.7</b> | Top left corner easting (*) (kilometers)      | * set the Y coordinate value |
| <b>977-992</b>   | <b>F16.7</b> | Top right corner northing (*) (kilometers)    | * set the X coordinate value |
| <b>993-1008</b>  | <b>F16.7</b> | Top right corner easting (*) (kilometers)     | * set the Y coordinate value |
| <b>1009-1024</b> | <b>F16.7</b> | Bottom right corner northing (*) (kilometers) | * set the X coordinate value |
| <b>1025-1040</b> | <b>F16.7</b> | Bottom right corner easting (*) (kilometers)  | * set the Y coordinate value |
| <b>1041-1056</b> | <b>F16.7</b> | Bottom left corner northing (*) (kilometers)  | * set the X coordinate value |
| <b>1057-1072</b> | <b>F16.7</b> | Bottom left corner easting (*) (kilometers)   | * set the Y coordinate value |
| <b>1073-1088</b> | <b>F16.7</b> | Top left corner latitude (deg)                |                              |
| <b>1089-1104</b> | <b>F16.7</b> | Top left corner longitude (deg)               |                              |
| <b>1105-1120</b> | <b>F16.7</b> | Top right corner latitude (deg)               |                              |

I

# MapProjectionDataRecord ( 11 / 12 )

| Bytes            | Format       | Description                                                            | Contents |
|------------------|--------------|------------------------------------------------------------------------|----------|
| <b>1121-1136</b> | <b>F16.7</b> | Top right corner longitude (deg)                                       |          |
| <b>1137-1152</b> | <b>F16.7</b> | Bottom right corner latitude (deg)                                     |          |
| <b>1153-1168</b> | <b>F16.7</b> | Bottom right corner longitude (deg)                                    |          |
| <b>1169-1184</b> | <b>F16.7</b> | Bottom left corner latitude (deg)                                      |          |
| <b>1185-1200</b> | <b>F16.7</b> | Bottom left corner longitude (deg)                                     |          |
| <b>1201-1216</b> | <b>CH</b>    | Top left corner terrain height relative to ellipsoid (meters) = blanks |          |
| <b>1217-1232</b> | <b>CH</b>    | Top right corner terrain height (meters) = blanks                      |          |
| <b>1233-1248</b> | <b>CH</b>    | Bottom right corner terrain height = blanks                            |          |
| <b>1249-1264</b> | <b>CH</b>    | Bottom left corner terrain height = blanks                             |          |

# MapProjectionDataRecord ( 12 / 12 )

| Bytes     | Format  | Description                                                                                                                                                                                                                                                                                                | Contents |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 1265-1424 | 8E20.10 | <p>Eight coefficients (A11, A12, ..., A24) to convert a line (L) and pixel (P) position to the map projection frame of reference, say (E, N) where:</p> $E = A11 + A12 * L + A13 * P + A14 * L * P$ $N = A21 + A22 * L + A23 * P + A24 * L * P$ <p>(The order of storing: A11, A12, A13, ..., A24)</p>     |          |
| 1425-1584 | 8E20.10 | <p>Eight coefficients (B11, B12, ..., B24) to convert from the map projection (E, N) to line (L) and pixel (P) position in the image, say (L, P) where:</p> $L = B11 + B12 * E + B13 * N + B14 * E * N$ $P = B21 + B22 * E + B23 * N + B24 * E * N$ <p>(The order of storing: B11, B12, B13, ..., B24)</p> |          |
| 1585-1620 | CH      | blanks                                                                                                                                                                                                                                                                                                     |          |

**PlatformPositionDataRecord ( 1 / 4 )**

| Bytes        | Format    | Description                                                                                                                                                                                                                                                 | Contents                         |
|--------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number<br>Level 1.1 = 3<br>Level 1.5 = 4                                                                                                                                                                                                    |                                  |
| <b>5</b>     | <b>B</b>  | 1st record sub-type code = 18                                                                                                                                                                                                                               | The value of Level 1.0 is copied |
| <b>6</b>     | <b>B</b>  | Record type code = 30                                                                                                                                                                                                                                       | The value of Level 1.0 is copied |
| <b>7</b>     | <b>B</b>  | 2nd record sub-type code = 18                                                                                                                                                                                                                               | The value of Level 1.0 is copied |
| <b>8</b>     | <b>B</b>  | 3rd record sub-type code = 20                                                                                                                                                                                                                               | The value of Level 1.0 is copied |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 4680                                                                                                                                                                                                                                | The value of Level 1.0 is copied |
| <b>13-44</b> | <b>CH</b> | Orbital elements designator<br>ALOS Orbit Information(Preliminary) : '0bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb'<br>ALOS Orbit Information(Decision) : '1bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb'<br>ALOS High Precision Orbit Information : '2bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb' | The value of Level 1.0 is copied |

**PlatformPositionDataRecord ( 2 / 4 )**

| Bytes          | Format       | Description                                                                                                                                                          | Contents                         |
|----------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>45-60</b>   | <b>F16.7</b> | 1st orbital element (x) (m)                                                                                                                                          |                                  |
| <b>61-76</b>   | <b>F16.7</b> | 2nd orbital element (y) (m)                                                                                                                                          |                                  |
| <b>77-92</b>   | <b>F16.7</b> | 3rd orbital element (z) (m)                                                                                                                                          |                                  |
| <b>93-108</b>  | <b>F16.7</b> | 4th orbital element (x') (m/sec)                                                                                                                                     |                                  |
| <b>109-124</b> | <b>F16.7</b> | 5th orbital element (y') (m/sec)                                                                                                                                     |                                  |
| <b>125-140</b> | <b>F16.7</b> | 6th orbital element (z') (m/sec)                                                                                                                                     |                                  |
| <b>141-144</b> | <b>I4</b>    | Number of data points<br>ALOS Orbit Information(Preliminary) : 'bb28'<br>ALOS Orbit Information(Decision) : 'bb28'<br>ALOS High Precision Orbit Information : 'bb28' | The value of Level 1.0 is copied |
| <b>145-148</b> | <b>I4</b>    | Year of data point. = 'YYYY'                                                                                                                                         | The value of Level 1.0 is copied |
| <b>149-152</b> | <b>I4</b>    | Month of data point. = 'bbMM'                                                                                                                                        | The value of Level 1.0 is copied |
| <b>153-156</b> | <b>I4</b>    | Day of data point. = 'bbDD'                                                                                                                                          | The value of Level 1.0 is copied |

F

**PlatformPositionDataRecord ( 3 / 4 )**

| Bytes          | Format        | Description                                              | Contents                         |
|----------------|---------------|----------------------------------------------------------|----------------------------------|
| <b>157-160</b> | <b>I4</b>     | Day in the year (UT) ( Ex: 2nd February ='bb33')         | The value of Level 1.0 is copied |
| <b>161-182</b> | <b>E22.15</b> | Seconds of day (UT) of data (Ex: 0: 51: 30.23 = 3090.23) | The value of Level 1.0 is copied |
| <b>183-204</b> | <b>E22.15</b> | Time interval between DATA points (sec) = 60             | The value of Level 1.0 is copied |
| <b>205-268</b> | <b>CH</b>     | Reference co-ordinate system(ECI,ECR) = 'ECRbb - bb'     | The value of Level 1.0 is copied |
| <b>269-290</b> | <b>E22.15</b> | Greenwich mean hour angle = always blank filled          | The value of Level 1.0 is copied |
| <b>291-306</b> | <b>F16.7</b>  | Along track position error (meter) = Nominal value       | The value of Level 1.0 is copied |
| <b>307-322</b> | <b>F16.7</b>  | Across track position error (meter) = Nominal value      | The value of Level 1.0 is copied |
| <b>323-338</b> | <b>F16.7</b>  | Radial position error (m/sec) = Nominal value            | The value of Level 1.0 is copied |
| <b>339-354</b> | <b>F16.7</b>  | Along track velocity error (m/sec) = Nominal value       | The value of Level 1.0 is copied |
| <b>355-370</b> | <b>F16.7</b>  | Across track velocity error (m/sec) = Nominal value      | The value of Level 1.0 is copied |
| <b>371-386</b> | <b>F16.7</b>  | Radial velocity error (m/sec) = Nominal value            | The value of Level 1.0 is copied |

**PlatformPositionDataRecord ( 4 / 4 )**

| Bytes            | Format             | Description                                                                                                                                | Contents                         |
|------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                  |                    | <b>FIRST POSITIONAL DATA POINT</b>                                                                                                         |                                  |
| <b>387-452</b>   | <b>3E22.15</b>     | 1st data point position vector as (X, Y, Z) co-ordinates for spaceborne sensor platform in a reference system (x, y, z) (meters)           | The value of Level 1.0 is copied |
| <b>453-518</b>   | <b>3E22.15</b>     | 1st data point velocity vector (X', Y', Z') in a reference system (x', y', z') (meter/sec)                                                 | The value of Level 1.0 is copied |
| <b>519-4082</b>  | <b>28*6*E22.15</b> | 2nd, 3rd, .. data point position & velocity vectors<br>(repetition of fields 29-34 as specified by the number of points in fields 141-144) | The value of Level 1.0 is copied |
| <b>4083-4100</b> | <b>CH</b>          | blanks                                                                                                                                     | The value of Level 1.0 is copied |
| <b>4101-4101</b> | <b>I1</b>          | Occurrence flag of a leap second<br>No leap second = '0'<br>Occurrence of a leap second = '1'                                              | The value of Level 1.0 is copied |
| <b>4102-4680</b> | <b>CH</b>          | blanks                                                                                                                                     | The value of Level 1.0 is copied |

# AttitudeDataRecord ( 1 / 3 )

| Bytes        | Format    | Description                                              | Contents                         |
|--------------|-----------|----------------------------------------------------------|----------------------------------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number<br>Level 1.1 = 4<br>Level 1.5 = 5 |                                  |
| <b>5</b>     | <b>B</b>  | 1st record sub-type code = 18                            | The value of Level 1.0 is copied |
| <b>6</b>     | <b>B</b>  | Record type code = 40                                    | The value of Level 1.0 is copied |
| <b>7</b>     | <b>B</b>  | 2nd record sub-type code = 18                            | The value of Level 1.0 is copied |
| <b>8</b>     | <b>B</b>  | 3rd record sub-type code = 20                            | The value of Level 1.0 is copied |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 8192                             | The value of Level 1.0 is copied |
| <b>13-16</b> | <b>I4</b> | Number of attitude data points = 'bb22', 'bb62'          | The value of Level 1.0 is copied |

# AttitudeDataRecord ( 2 / 3 )

| Bytes | Format | Description                                             | Contents                         |
|-------|--------|---------------------------------------------------------|----------------------------------|
| 17-20 | I4     | Day of the year                                         | The value of Level 1.0 is copied |
| 21-28 | I8     | Millisecond of day ('bbbbbbb0' - '86399999')            | The value of Level 1.0 is copied |
| 29-32 | I4     | Pitch data quality flag<br>Good : 'bbb0'<br>NG : 'bbb1' | The value of Level 1.0 is copied |
| 33-36 | I4     | Roll data quality flag<br>Good : 'bbb0'<br>NG : 'bbb1'  | The value of Level 1.0 is copied |
| 37-40 | I4     | Yaw data quality flag<br>Good : 'bbb0'<br>NG : 'bbb1'   | The value of Level 1.0 is copied |
| 41-54 | E14.6  | Pitch (degrees)                                         | The value of Level 1.0 is copied |
| 55-68 | E14.6  | Roll (degrees)                                          | The value of Level 1.0 is copied |
| 69-82 | E14.6  | Yaw (degrees)                                           | The value of Level 1.0 is copied |

# AttitudeDataRecord ( 3 / 3 )

| Bytes                    | Format             | Description                                                                                    | Contents                         |
|--------------------------|--------------------|------------------------------------------------------------------------------------------------|----------------------------------|
| <b>83-86</b>             | <b>I4</b>          | Pitch rate data quality flag<br>Good : 'bbb0'<br>NG : 'bbb1'                                   | The value of Level 1.0 is copied |
| <b>87-90</b>             | <b>I4</b>          | Roll rate data quality flag<br>Good : 'bbb0'<br>NG : 'bbb1'                                    | The value of Level 1.0 is copied |
| <b>91-94</b>             | <b>I4</b>          | Yaw rate data quality flag<br>Good : 'bbb0'<br>NG : 'bbb1'                                     | The value of Level 1.0 is copied |
| <b>95-108</b>            | <b>E14.6</b>       | Pitch rate (degrees/sec)                                                                       | The value of Level 1.0 is copied |
| <b>109-122</b>           | <b>E14.6</b>       | Roll rate (degrees/sec)                                                                        | The value of Level 1.0 is copied |
| <b>123-136</b>           | <b>E14.6</b>       | Yaw rate (degrees/sec)                                                                         | The value of Level 1.0 is copied |
| <b>137-2658 or 7458</b>  | <b>I4/I8/E14.6</b> | 2nd, 3rd, ... attitude data points<br>(repetition of byets 17-136 as specified in bytes 13-16) | The value of Level 1.0 is copied |
| <b>2659 or 7459-8192</b> | <b>CH</b>          | blanks                                                                                         | The value of Level 1.0 is copied |

# RadiometricDataRecord ( 1 / 3 )

| Bytes | Format | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Contents |
|-------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 1-4   | B      | Record sequence number<br>Level 1.1 = 5<br>Level 1.5 = 6                                                                                                                                                                                                                                                                                                                                                                                                                    |          |
| 5     | B      | 1st record sub-type code = 18                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |
| 6     | B      | Record type code = 50                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |
| 7     | B      | 2nd record sub-type code = 18                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |
| 8     | B      | 3rd record sub-type code = 20                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |
| 9-12  | B      | Length of this record = 9860                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |
| 13-16 | I4     | Radiometric Data Record sequence number ( starts at 1 ) = 'bbb1'                                                                                                                                                                                                                                                                                                                                                                                                            |          |
| 17-20 | I4     | Number of Radiometric Data Record fields = 'bbb1'                                                                                                                                                                                                                                                                                                                                                                                                                           |          |
|       |        | Radiometric Data Set                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |
| 21-36 | F16.7  | Calibration factor (CF)<br>Level 1.1 : $s^0 = 10 * \log_{10} \langle I^2 + Q^2 \rangle + CF - 32.0$<br>Level 1.5 : $s^0 = 10 * \log_{10} \langle DN^2 \rangle + CF$<br>This means that the sigma-naught of the pixel can be obtained by the ensemble averaging (<>) of the pixel values, in reality, the spatial averaging of the pixel values around the target. Here, I, Q, and DN in <> of the above formulas are the pixel values in levels 1.1, and 1.5, respectively. |          |

F  
I  
G

# RadiometricDataRecord ( 2 / 3 )

| Bytes   | Format | Description                                                                                                                                          | Contents |
|---------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 37-52   | F16.7  | Transmission and reception distortion matrices applied for polarimetric data (level 1.1, *)<br>Real part of transmission distortion matrix (DT)(1,1) |          |
| 53-68   | F16.7  | Imaginary part of DT (1,1)                                                                                                                           |          |
| 69-84   | F16.7  | Real part of DT (1,2)                                                                                                                                |          |
| 85-100  | F16.7  | Imaginary part of DT (1,2)                                                                                                                           |          |
| 101-116 | F16.7  | Real part of DT (2, 1)                                                                                                                               |          |
| 117-132 | F16.7  | Imaginary part of DT(2, 1)                                                                                                                           |          |
| 133-148 | F16.7  | Real part of DT (2, 2)                                                                                                                               |          |
| 149-164 | F16.7  | Imaginary part of DT (2, 2)                                                                                                                          |          |
| 165-180 | F16.7  | Real part of reception distortion matrix (DR)(1,1)                                                                                                   |          |
| 181-196 | F16.7  | Imaginary part of DR (1,1)                                                                                                                           |          |
| 197-212 | F16.7  | Real part of DR (1,2)                                                                                                                                |          |

G

# RadiometricDataRecord ( 3 / 3 )

| Bytes    | Format | Description                 | Contents |
|----------|--------|-----------------------------|----------|
| 213-228  | F16.7  | Imaginary part of DR (1,2)  |          |
| 229-244  | F16.7  | Real part of DR (2, 1)      |          |
| 245-260  | F16.7  | Imaginary part of DR (2, 1) |          |
| 261-276  | F16.7  | Real part of DR(2, 2)       |          |
| 277-292  | F16.7  | Imaginary part of DR (2, 2) |          |
| 293-9860 | CH     | Reserve (blanks)            |          |

(\*) Notes:

The measured scattering matrix can be expressed by

$$\begin{pmatrix} Z_{hh} & Z_{hv} \\ Z_{vh} & Z_{vv} \end{pmatrix} = A \frac{1}{r} e^{\frac{-j^4 \pi r}{\lambda}} \begin{pmatrix} 1 & \delta_3 \\ \delta_4 & f_2 \end{pmatrix} \begin{pmatrix} S_{hh} & S_{hv} \\ S_{vh} & S_{vv} \end{pmatrix} \begin{pmatrix} 1 & \delta_1 \\ \delta_2 & f_1 \end{pmatrix} + \begin{pmatrix} N_{hh} & N_{hv} \\ N_{vh} & N_{vv} \end{pmatrix} \quad (1)$$

where Zij is the measurement matrix of the target, j is the transmission polarization, i is the reception polarization, A is the amplitude, r is the slant range, Sij is the true scattering matrix of the target, f1 is the channel imbalance of the transmission distortion matrix, f2 is that for the reception matrix, delta1 and delta2 are the cross talks of transmission, and delta3 and delta4 are the those for the reception, Nij are the noise component. Here, Nij is assumed to be zero. It should be noted that polarization notation of the pdouct is different from the above , i.e., IMG-HV-ALPSR..., means the data acquitred at H transmission and V reception.

Complex transmission distortion matrix (1, delta1, delta2, f1) are stored from 37 to 164 bytes, and reception distortion matrix (1, delta3, delta4, and f2) are stored from 165 to 292 bytes.

# DataQualitySummaryRecord ( 1 / 5 )

| Bytes        | Format    | Description                                                                                                                                   | Contents |
|--------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number<br>Level 1.1 = 6<br>Level 1.5 = 7                                                                                      |          |
| <b>5</b>     | <b>B</b>  | 1st record sub-type code = 18                                                                                                                 |          |
| <b>6</b>     | <b>B</b>  | Record type code = 60                                                                                                                         |          |
| <b>7</b>     | <b>B</b>  | 2nd record sub-type code = 18                                                                                                                 |          |
| <b>8</b>     | <b>B</b>  | 3rd record sub-type code = 20                                                                                                                 |          |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 1620                                                                                                                  |          |
| <b>13-16</b> | <b>I4</b> | Data summary quality record sequence number (starts at 1) = 'bbb1'                                                                            |          |
| <b>17-20</b> | <b>CH</b> | SAR channel indicator                                                                                                                         |          |
| <b>21-26</b> | <b>CH</b> | Date of the last calibration update = 'YYMMDD'<br>where 'YY' : last two digits of year<br>'MM' : month of the year<br>'DD' : day of the month |          |
| <b>27-30</b> | <b>I4</b> | Number of channels (up to 16)                                                                                                                 |          |

# DataQualitySummaryRecord ( 2 / 5 )

| Bytes   | Format | Description                                           | Contents |
|---------|--------|-------------------------------------------------------|----------|
|         |        | ABSOLUTE RADIOMETRIC DATA QUALITY                     |          |
| 31-46   | F16.7  | Nominal Integrated Side Lobe Ratio (ISLR) (dB)        |          |
| 47-62   | F16.7  | Nominal Peak Side Lobe to main lobe Ratio (PSLR) (dB) |          |
| 63-78   | F16.7  | Nominal azimuth ambiguity (AAR)                       |          |
| 79-94   | F16.7  | Nominal range ambiguity (RAR)                         |          |
| 95-110  | F16.7  | Estimate of SNR (from range spectra) (dB)             |          |
| 111-126 | F16.7  | Actual Bit Error Rate (BER)                           |          |
| 127-142 | F16.7  | Nominal slant range resolution (meters)               |          |
| 143-158 | F16.7  | Nominal azimuth resolution (meters)                   |          |
| 159-174 | F16.7  | Nominal radiometric resolution (dB)                   |          |
| 175-190 | F16.7  | Instantaneous dynamic range (dB)                      |          |

|I

# DataQualitySummaryRecord ( 3 / 5 )

| Bytes          | Format           | Description                                                                                                                                                   | Contents |
|----------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>191-206</b> | <b>F16.7</b>     | Nominal absolute radiometric calibration magnitude of uncertainty of SAR channel indicated in bytes 17-20 (dB)                                                |          |
| <b>207-222</b> | <b>F16.7</b>     | Nominal absolute radiometric calibration magnitude uncertainty of SAR channel indicated in bytes 17-20 (deg)                                                  |          |
|                |                  | RELATIVE RADIOMETRIC DATA QUALITY                                                                                                                             |          |
| <b>223-238</b> | <b>F16.7</b>     | Nominal relative radiometric calibration magnitude uncertainty of SAR channel (bytes 17-20) versus first of the other channels on a multi-channel volume (dB) |          |
| <b>239-254</b> | <b>F16.7</b>     | Nominal relative radiometric calibration phase uncertainty of SAR channel (bytes 17-20) versus first of the other channels on a multi-channel volume (deg)    |          |
| <b>255-734</b> | <b>15*2F16.7</b> | Repetition of bytes 223 - 254 for the remaining channels (up to 16 channels)                                                                                  |          |

DataQualitySummaryRecord ( 4 / 5 )

| Bytes   | Format | Description                                           | Contents |
|---------|--------|-------------------------------------------------------|----------|
|         |        | ABSOLUTE GEOMETRIC DATA QUALITY                       |          |
| 735-750 | F16.7  | Nominal absolute location error along track (meters)  |          |
| 751-766 | F16.7  | Nominal absolute location error cross track (meters)  |          |
| 767-782 | F16.7  | Nominal geometric distortion scale in line direction  |          |
| 783-798 | F16.7  | Nominal geometric distortion scale in pixel direction |          |
| 799-814 | F16.7  | Nominal geometric distortion skew                     |          |
| 815-830 | F16.7  | Scene orientation error                               |          |

**DataQualitySummaryRecord ( 5 / 5 )**

| Bytes            | Format           | Description                                                                                                                                                | Contents |
|------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>831-846</b>   | <b>F16.7</b>     | RELATIVE GEOMETRIC DATA QUALITY<br><br>Along track relative misregistration error of SAR channel (bytes 17-20) versus first of the other channels (meters) |          |
| <b>847-862</b>   | <b>F16.7</b>     | Cross track relative misregistration error of SAR channel (bytes 17-20) versus first of the other channels (meters)                                        |          |
| <b>863-1102</b>  | <b>15*2F16.7</b> | Repetition of bytes 831 - 862 for the other channels (up to 16 channels)                                                                                   |          |
| <b>1103-1620</b> | <b>CH</b>        | blanks                                                                                                                                                     |          |

# FacilityRelatedDataRecord1-10 ( 1 / 3 )

| Bytes | Format | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Contents |
|-------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 1-4   | B      | <p>Record sequence number</p> <p>Level 1.1 :</p> <p>TT&amp;C system telemetry data = 7</p> <p>Attitude determination 3 and GPSR raw data = 8</p> <p>PALSAR mission telemetry data = 9</p> <p>ALOS Orbit Information(Preliminary)(ECR) = 10</p> <p>ALOS Orbit Information(Decision)(ECR) = 11</p> <p>Time difference information = 12</p> <p>ALOS High Precision Orbit Information = 13</p> <p>High Precision Attitude Information = 14</p> <p>Coordinates Conversion Information = 15</p> <p>Workorder &amp; Workreport for level 1.0 processing = 16</p> <p>Level 1.5 :</p> <p>TT&amp;C system telemetry data = 8</p> <p>Attitude determination 3 and GPSR raw data = 9</p> <p>PALSAR mission telemetry data = 10</p> <p>ALOS Orbit Information(Preliminary)(ECR) = 11</p> <p>ALOS Orbit Information(Decision)(ECR) = 12</p> <p>Time difference information = 13</p> <p>ALOS High Precision Orbit Information = 14</p> <p>High Precision Attitude Information = 15</p> <p>Coordinates Conversion Information = 16</p> <p>Workorder &amp; Workreport for level 1.0 processing = 17</p> |          |

# FacilityRelatedDataRecord1-10 ( 2 / 3 )

| Bytes | Format | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Contents                         |
|-------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 5     | B      | 1st record sub-type code = 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | The value of Level 1.0 is copied |
| 6     | B      | Record type code = 200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | The value of Level 1.0 is copied |
| 7     | B      | 2nd record sub-type code = 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | The value of Level 1.0 is copied |
| 8     | B      | 3rd record sub-type code = 106) <sub>8</sub><br>CEOS = 10, CCRS = 36, ESA = 50, NASA = 60,<br>JPL = 61, <u>JAXA</u> = 70, DFVLR = 80, RAE = 90,<br>TELESPAZIO = 100, UNSPECIFIED = 18 etc.                                                                                                                                                                                                                                                                                                                              | The value of Level 1.0 is copied |
| 9-12  | B      | Length of this record<br>TT&C system telemetry data = 1540000<br>Attitude determination 3 and GPSR raw data = 4314000<br>PALSAR mission telemetry data = 345000<br>ALOS Orbit Information(Preliminary)(ECR) = 325000<br>ALOS Orbit Information(Decision)(ECR) = 325000<br>Time difference information 3072<br>ALOS High Precision Orbit Information = 511000<br>High Precision Attitude Information = 4370000<br>Coordinates Conversion Information = 728000<br>Workorder & Workreport for level 1.0 processing = 15000 | The value of Level 1.0 is copied |

|E

|A

|A

# FacilityRelatedDataRecord1-10 ( 3 / 3 )

| Bytes        | Format     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Contents                         |
|--------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>13-16</b> | <b>I4</b>  | Facility Related Data Record sequence number = 'bbb1' - 'bb10'                                                                                                                                                                                                                                                                                                                                                                                                | The value of Level 1.0 is copied |
| <b>17-66</b> | <b>CH</b>  | Always blank filled                                                                                                                                                                                                                                                                                                                                                                                                                                           | The value of Level 1.0 is copied |
| <b>67-</b>   | <b>---</b> | set the original data used for processing level 1.0<br>TT&C system telemetry data<br>Attitude determination 3 and GPSR raw data<br>PALSAR mission telemetry data<br>ALOS Orbit Information(Preliminary)(ECR)<br>ALOS Orbit Information(Decision)(ECR)<br>Time difference information<br>ALOS High Precision Orbit Information<br>High Precision Attitude Information<br>Coordinates Conversion Information<br>Workorder & Workreport for level 1.0 processing | The value of Level 1.0 is copied |

# FacilityRelatedDataRecord11 ( 1 / 4 )

| Bytes        | Format    | Description                                                                                                                                                                 | Contents |
|--------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number<br>Level 1.1 = 17<br>Level 1.5 = 18                                                                                                                  |          |
| <b>5</b>     | <b>B</b>  | 1st record sub-type code = 18                                                                                                                                               |          |
| <b>6</b>     | <b>B</b>  | Record type code = 200                                                                                                                                                      |          |
| <b>7</b>     | <b>B</b>  | 2nd record sub-type code = 18                                                                                                                                               |          |
| <b>8</b>     | <b>B</b>  | 3rd record sub-type code = 70<br>CEOS = 10, CCRS = 36, ESA = 50, NASA = 60,<br>JPL = 61, <u>JAXA</u> = 70, DFVLR = 80, RAE = 90,<br>TELESPAZIO = 100, UNSPECIFIED = 18 etc. |          |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 1024                                                                                                                                                |          |
| <b>13-16</b> | <b>I4</b> | Facility Related Data Record sequence number = 'bb11'                                                                                                                       |          |

|F

# FacilityRelatedDataRecord11 ( 2 / 4 )

| Bytes  | Format   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Contents |
|--------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 17-416 | 20E20.10 | <p>twenty coefficients (<math>a_0, a_1, \dots, a_9</math> &amp; <math>b_0, b_1, \dots, b_9</math>) to convert from the map projection (E, N) to line (L) and pixel (P) position in the image, say (P, L) where:</p> $P = a_0 + a_1*N + a_2*E + a_3*N*E + a_4*N^2 + a_5*E^2 + a_6*N^2*E + a_7*N*E^2 + a_8*N^3 + a_9*E^3$ $L = b_0 + b_1*N + b_2*E + b_3*N*E + b_4*N^2 + b_5*E^2 + b_6*N^2*E + b_7*N*E^2 + b_8*N^3 + b_9*E^3$ <p>(The order of storing: <math>a_0, a_1, \dots, a_9</math> &amp; <math>b_0, b_1, \dots, b_9</math>)</p> <p>Level 1.1 = blank filled</p> |          |

**FacilityRelatedDataRecord11 ( 3 / 4 )**

| Bytes          | Format    | Description                                                                                                                                                                                                                                                                 | Contents |
|----------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>417-420</b> | <b>I4</b> | Calibration data indicator<br>no calibration data = 'bbb0'<br>including calibration data at the edge of upper image = 'bbb1'<br>including calibration data at the edge of lower image = 'bbb2'<br>including calibration data at the edges of upper and lower image = 'bbb3' |          |
| <b>421-428</b> | <b>I8</b> | Start line number of calibration at upper image<br>In case of no calibration data, always = bbbbbb0'                                                                                                                                                                        |          |
| <b>429-436</b> | <b>I8</b> | Stop line number of calibration at upper image<br>In case of no calibration data, always = bbbbbb0'                                                                                                                                                                         |          |
| <b>437-444</b> | <b>I8</b> | Start line number of calibration at bottom image<br>In case of no calibration data, always = bbbbbb0'                                                                                                                                                                       |          |
| <b>445-452</b> | <b>I8</b> | Stop line number of calibration at bottom image<br>In case of no calibration data, always = bbbbbb0'                                                                                                                                                                        |          |

**FacilityRelatedDataRecord11 ( 4 / 4 )**

| Bytes           | Format    | Description                                                                                                                              | Contents |
|-----------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>453-456</b>  | <b>I4</b> | PRF switching indicator<br>a fixed PRF = 'bbb0'<br>variable PRFs except Wide observation mode = 'bbb1'<br>Wide observation mode = 'bbb1' |          |
| <b>457-464</b>  | <b>I8</b> | Line locator of PRF switching<br>a fixed PRF = 'bbbbbbb1'<br>Wide observation mode = 'bbbbbbb0'                                          |          |
| <b>465-472</b>  | <b>I8</b> | SIGMA- SAR processing start line number                                                                                                  | F        |
| <b>473-480</b>  | <b>I8</b> | Number of loss lines (Level 1.0)                                                                                                         |          |
| <b>481-488</b>  | <b>I8</b> | Number of loss lines (range for processing in Level 1.1, Level 1.5)                                                                      |          |
| <b>489-800</b>  | <b>CH</b> | Always blank filled                                                                                                                      | A        |
| <b>801-1024</b> | <b>CH</b> | system reserve                                                                                                                           | A        |

**ImageFileDescriptorRecord ( 1 / 14 )**

| Bytes        | Format    | Description                                                                                 | Contents                         |
|--------------|-----------|---------------------------------------------------------------------------------------------|----------------------------------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number = 1                                                                  | The value of Level 1.0 is copied |
| <b>5</b>     | <b>B</b>  | 1st record sub-type code = 50                                                               | The value of Level 1.0 is copied |
| <b>6</b>     | <b>B</b>  | Record type code = 192                                                                      | The value of Level 1.0 is copied |
| <b>7</b>     | <b>B</b>  | 2nd record sub-type code = 18                                                               | The value of Level 1.0 is copied |
| <b>8</b>     | <b>B</b>  | 3rd record sub-type code = 18                                                               | The value of Level 1.0 is copied |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 720                                                                 | The value of Level 1.0 is copied |
| <b>13-14</b> | <b>CH</b> | ASCII/EBCDIC flag = 'Ab' for ASCII                                                          | The value of Level 1.0 is copied |
| <b>15-16</b> | <b>CH</b> | Always blank filled                                                                         | The value of Level 1.0 is copied |
| <b>17-28</b> | <b>CH</b> | Superstructure format control document ID. (the ID of the CCB document)<br>= 'CEOS-SAR-CCT' | The value of Level 1.0 is copied |

**ImageFileDescriptorRecord ( 2 / 14 )**

| Bytes        | Format    | Description                                                                                                                                                           | Contents                         |
|--------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>29-30</b> | <b>CH</b> | Format control document revision level = 'bA'                                                                                                                         | The value of Level 1.0 is copied |
| <b>31-32</b> | <b>CH</b> | File design descriptor revision letter = 'bA'                                                                                                                         | The value of Level 1.0 is copied |
| <b>33-44</b> | <b>CH</b> | Logical volume generating facility software release and revision level<br>(i.e. name and version left justified) = 'NN.NNbbbbbbb'<br>1.00, 1.01, ..., 1.10, ..., 2.00 | The value of Level 1.0 is copied |
| <b>45-48</b> | <b>I4</b> | File number = 'bbb1'                                                                                                                                                  | The value of Level 1.0 is copied |

A

# ImageFileDescriptorRecord ( 3 / 14 )

| Bytes        | Format    | Description                                                                                                                                                                                                                                                                                                                                         | Contents                                                                               |
|--------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>49-64</b> | <b>CH</b> | Referenced file name (16 characters indicating nature of the data, i.e. header, annotation, SAR product type, etc.) = 'MMNbSSSTFFFFbbbb'<br>MM : Mission ID (ALOS='AL') (*2)<br>N : Mission number (ALOS='1') (*2)<br>SSS : Sensor ID (PALSAR='PSR') (*2)<br>T : Processing Level Code (*1)<br>FFFF : File Type Code (*2)<br>SAR Data File = 'IMOP' | (*1)<br>'B' : Level 1.1<br>'C' : Level 1.5<br><br>(*2)The value of Level 1.0 is copied |

## ImageFileDescriptorRecord ( 4 / 14 )

| Bytes          | Format    | Description                                            | Contents                         |
|----------------|-----------|--------------------------------------------------------|----------------------------------|
| <b>65-68</b>   | <b>CH</b> | Record sequence and location type flag<br>= 'FSEQ'     | The value of Level 1.0 is copied |
| <b>69-76</b>   | <b>I8</b> | Record sequence and location type flag<br>= 'bbbbbbb1' | The value of Level 1.0 is copied |
| <b>77-80</b>   | <b>I4</b> | Sequence number location<br>= 'bbb4'                   | The value of Level 1.0 is copied |
| <b>81-84</b>   | <b>CH</b> | Record code and location type flag<br>= 'FTYP'         | The value of Level 1.0 is copied |
| <b>85-92</b>   | <b>I8</b> | Record code location<br>= 'bbbbbbb5'                   | The value of Level 1.0 is copied |
| <b>93-96</b>   | <b>I4</b> | Record code field length<br>= 'bbb4'                   | The value of Level 1.0 is copied |
| <b>97-100</b>  | <b>CH</b> | Record length and location type flag<br>= 'FLGT'       | The value of Level 1.0 is copied |
| <b>101-108</b> | <b>I8</b> | Record length location<br>= 'bbbbbbb9'                 | The value of Level 1.0 is copied |

# ImageFileDescriptorRecord ( 5 / 14 )

| Bytes          | Format    | Description                            | Contents                         |
|----------------|-----------|----------------------------------------|----------------------------------|
| <b>109-112</b> | <b>I4</b> | Record length field length<br>= 'bbb4' | The value of Level 1.0 is copied |
| <b>113-180</b> | <b>CH</b> | Reserved = Always blank filled         | The value of Level 1.0 is copied |

# ImageFileDescriptorRecord ( 6 / 14 )

| Bytes          | Format    | Description                    | Contents                         |
|----------------|-----------|--------------------------------|----------------------------------|
| <b>181-186</b> | <b>I6</b> | Number of SAR DATA records     |                                  |
| <b>187-192</b> | <b>I6</b> | SAR DATA record length (bytes) |                                  |
| <b>193-216</b> | <b>CH</b> | Reserved = Always blank filled |                                  |
|                |           |                                | The value of Level 1.0 is copied |

# ImageFileDescriptorRecord ( 7 / 14 )

| Bytes          | Format    | Description                                                                                    | Contents                         |
|----------------|-----------|------------------------------------------------------------------------------------------------|----------------------------------|
| <b>217-220</b> | <b>I4</b> | SAMPLE GROUP DATA<br><br>Number of bits per sample<br>Level 1.1 = 'bb32'<br>Level 1.5 = 'bb16' |                                  |
| <b>221-224</b> | <b>I4</b> | Number of samples per data group (or pixel)<br>Level 1.1 = 'bbb2'<br>Level 1.5 = 'bbb1'        |                                  |
| <b>225-228</b> | <b>I4</b> | Number of bytes per data group (or pixel)<br>Level 1.1 = 'bbb8'<br>Level 1.5 = 'bbb2'          |                                  |
| <b>229-232</b> | <b>CH</b> | Justification and order of samples within data group (or pixel) = Always blank filled          | The value of Level 1.0 is copied |

# ImageFileDescriptorRecord ( 8 / 14 )

| Bytes   | Format | Description                                                                                                                                                                                                                                                   | Contents                         |
|---------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|         |        | SAR RELATED DATA IN THE RECORD                                                                                                                                                                                                                                |                                  |
| 233-236 | I4     | Number of SAR channels in this tile = 'bbb1'                                                                                                                                                                                                                  | The value of Level 1.0 is copied |
| 237-244 | I8     | Number of lines per data set (one channel) in this file (excluding border lines)                                                                                                                                                                              |                                  |
| 245-248 | I4     | Number or left border pixels per line = 'bbb0'                                                                                                                                                                                                                |                                  |
| 249-256 | I8     | Total number of data groups (or pixels) per line per SAR channel<br>For level 1.1 products, each data record corresponds to 1 image range line.<br>Each range line begins at the <u>nearest</u> -range pixel and<br>ends at the <u>farthest</u> -range pixel. |                                  |
| 257-260 | I4     | Number of right border pixels per line = 'bbb0'                                                                                                                                                                                                               |                                  |

E  
F

# ImageFileDescriptorRecord ( 9 / 14 )

| Bytes          | Format    | Description                                | Contents                         |
|----------------|-----------|--------------------------------------------|----------------------------------|
| <b>261-264</b> | <b>I4</b> | Number of top border lines = 'bbb0'        | The value of Level 1.0 is copied |
| <b>265-268</b> | <b>I4</b> | Number of bottom border lines = 'bbb0'     | The value of Level 1.0 is copied |
| <b>269-272</b> | <b>CH</b> | Interleaving indicator = 'BSQb'            | The value of Level 1.0 is copied |
| <b>273-274</b> | <b>I2</b> | RECORD DATA IN THE FILE                    |                                  |
|                |           | Number of physical records per line = 'b1' |                                  |

**ImageFileDescriptorRecord ( 10 / 14 )**

| Bytes          | Format    | Description                                                                           | Contents                                          |
|----------------|-----------|---------------------------------------------------------------------------------------|---------------------------------------------------|
| <b>275-276</b> | <b>I2</b> | Number of physical records per multi-channel line in this file = 'b1'                 |                                                   |
| <b>277-280</b> | <b>I4</b> | Number of bytes of prefix data per record<br>Level 1.1 = 'b412'<br>Level 1.5 = 'b192' | In Level 1.1,<br>the value of Level 1.0 is copied |

**ImageFileDescriptorRecord ( 11 / 14 )**

| Bytes          | Format    | Description                                                                                                                                                                                                                                              | Contents                         |
|----------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>281-288</b> | <b>I8</b> | Number of bytes of SAR data (or pixel data) data per record<br>For level 1.1 products, each data record corresponds to 1 image range line.<br>Each range line begins at the <u>nearest</u> -range pixel and<br>ends at the <u>farthest</u> -range pixel. |                                  |
| <b>289-292</b> | <b>I4</b> | Number of bytes of suffix data per record<br>= 'bbb0'                                                                                                                                                                                                    | The value of Level 1.0 is copied |
| <b>293-296</b> | <b>CH</b> | Prefix/suffix repeat flag<br>= 'bbbb'                                                                                                                                                                                                                    | The value of Level 1.0 is copied |

E  
F

# ImageFileDescriptorRecord ( 12 / 14 )

| Bytes   | Format                                                 | Description                                            | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |                                                        |     |                 |   |               |   |                     |
|---------|--------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------|-----|-----------------|---|---------------|---|---------------------|
|         |                                                        | PREFIX/SUFFIX DATA LOCATORS                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 297-304 | CH                                                     | Sample data line number locator = 'bb13b4PB'           | <div>The value of Level 1.0 is copied</div> <div>The contents of locator :</div> <table><tr><td>1-4</td><td>Start byte number of the field withib<br/>PREFIX/SUFFIX</td></tr><tr><td>5-6</td><td>Length in bytes</td></tr><tr><td>7</td><td>PREFIX/SUFFIX</td></tr><tr><td>8</td><td>Type of data format</td></tr></table> <div>PREFIX/SUFFIX<br/>'P' : PREFIX<br/>'S' : SUFFIX<br/>Type of data format :<br/>'A' : ASCII<br/>'B' : Binary<br/>'N' : Numeric</div> | 1-4 | Start byte number of the field withib<br>PREFIX/SUFFIX | 5-6 | Length in bytes | 7 | PREFIX/SUFFIX | 8 | Type of data format |
| 1-4     | Start byte number of the field withib<br>PREFIX/SUFFIX |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 5-6     | Length in bytes                                        |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 7       | PREFIX/SUFFIX                                          |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 8       | Type of data format                                    |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 305-312 | CH                                                     | SAR channel number locator = 'bb49b2PB'                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 313-320 | CH                                                     | Time of SAR data line locator = 'bb45b4PB'             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 321-328 | CH                                                     | Left-fill count locator = 'bb21b4PB'                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 329-336 | CH                                                     | Right-fill count locator = 'bb29b4PB'                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 337-340 | CH                                                     | Pad pixels present indicator 'YESb' or 'NObb' = 'bbbb' |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 341-368 | CH                                                     | Always blank filled                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 369-376 | CH                                                     | SAR data line quality code locator = 'bb97b4PB'        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                        |     |                 |   |               |   |                     |
| 377-384 | CH                                                     | Calibration information field locator = 'bbbbbbbbb'    | The value of Level 1.0 is copied                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                                        |     |                 |   |               |   |                     |
| 385-392 | CH                                                     | Gain values field locator = 'bbbbbbbbb'                | The value of Level 1.0 is copied                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                                        |     |                 |   |               |   |                     |
| 393-400 | CH                                                     | Bias values filed locator = 'bbbbbbbbb'                | The value of Level 1.0 is copied                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                                        |     |                 |   |               |   |                     |

ImageFileDescriptorRecord ( 13 / 14 )

| Bytes          | Format    | Description                                                                                                 | Contents |
|----------------|-----------|-------------------------------------------------------------------------------------------------------------|----------|
| <b>401-428</b> | <b>CH</b> | SAR Data format type<br>Level 1.1 = 'COMPLEX*8bbbbbbbbbbbbbbbb'<br>Level 1.5 = 'UNSIGNEDbINTEGER*2bbbbbbbb' |          |
| <b>429-432</b> | <b>CH</b> | SAR Data format type code<br>Level 1.1 = 'C*8b'<br>Level 1.5 = 'IU2b'                                       |          |

**ImageFileDescriptorRecord ( 14 / 14 )**

| Bytes          | Format    | Description                                                                                  | Contents                         |
|----------------|-----------|----------------------------------------------------------------------------------------------|----------------------------------|
| <b>433-436</b> | <b>I4</b> | Number of left fill bits within pixel<br>Level 1.1 = 'bbb0'<br>Level 1.5 = 'bbb0'            |                                  |
| <b>437-440</b> | <b>I4</b> | Number of right fill bits within pixel<br>Level 1.1 = 'bbb0'<br>Level 1.5 = 'bbb0'           |                                  |
| <b>441-448</b> | <b>I8</b> | Maximum data range of pixel (starting form 0)<br>Level 1.1 = blank<br>Level 1.5 = 'bbb65535' |                                  |
| <b>449-720</b> | <b>CH</b> | Always blank filled                                                                          | The value of Level 1.0 is copied |

|I

# SignalDataRecord ( 1 / 7 )

| Bytes       | Format   | Description                        | Contents                         |
|-------------|----------|------------------------------------|----------------------------------|
| <b>1-4</b>  | <b>B</b> | Record sequence number = 2, 3, ... |                                  |
| <b>5</b>    | <b>B</b> | 1st record sub-type code = 50      | The value of Level 1.0 is copied |
| <b>6</b>    | <b>B</b> | Record type code = 10              | The value of Level 1.0 is copied |
| <b>7</b>    | <b>B</b> | 2nd record sub-type code = 18      | The value of Level 1.0 is copied |
| <b>8</b>    | <b>B</b> | 3rd record sub-type code = 20      | The value of Level 1.0 is copied |
| <b>9-12</b> | <b>B</b> | Length of this record              |                                  |

# SignalDataRecord ( 2 / 7 )

| Bytes | Format | Description                                                                                                                                                                                                                                   | Contents |
|-------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|       |        | PREFIX DATA-GENERAL INFORMATION                                                                                                                                                                                                               |          |
| 13-16 | B      | SAR image data line number = 1, 2, ...                                                                                                                                                                                                        |          |
| 17-20 | B      | SAR image data record index = 1<br>(indicates the record sequence number in the image line)                                                                                                                                                   |          |
| 21-24 | B      | Actual count of left-fill pixels = 0                                                                                                                                                                                                          |          |
| 25-28 | B      | Actual count of data pixels<br>For level 1.1 products, actual count of data pixels corresponds to the number of 1 image range pixels. Each range line begins at the <u>nearest</u> -range pixel and ends at the <u>farthest</u> -range pixel. |          |
| 29-32 | B      | Actual count of right-fill pixels = 0                                                                                                                                                                                                         |          |

E  
F

# SignalDataRecord ( 3 / 7 )

| Bytes | Format | Description                                                                                                                                           | Contents                         |
|-------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|       |        | PREFIX DATA-SENSOR PARAMETERS                                                                                                                         |                                  |
| 33-36 | B      | Sensor parameters update flag = 0<br>(1=data in this section is an update, 0=data is a repeat)                                                        |                                  |
| 37-40 | B      | Sensor acquisition year (UT)<br>Scene start year                                                                                                      |                                  |
| 41-44 | B      | Sensor acquisition day of year (UT)<br>Scene start day of year                                                                                        |                                  |
| 45-48 | B      | Sensor acquisition milliseconds of day (UT)                                                                                                           |                                  |
| 49-50 | B      | SAR channel indicator (sequence number in multi-channel SAR data)<br>where : single polarization = 1<br>dual polarization = 2<br>Polarimetry mode = 4 | The value of Level 1.0 is copied |
| 51-52 | B      | SAR channel code = 0<br>(0=L, 1=5, 2=C, 3=X, 4=KU and 5=KA channel)                                                                                   | The value of Level 1.0 is copied |
| 53-54 | B      | Transmitted polarization (0=H, 1=V)                                                                                                                   | The value of Level 1.0 is copied |
| 55-56 | B      | Received polarization (0=H, 1=V)                                                                                                                      | The value of Level 1.0 is copied |

|F

# SignalDataRecord ( 4 / 7 )

| Bytes        | Format   | Description                                                                      | Contents                         |
|--------------|----------|----------------------------------------------------------------------------------|----------------------------------|
| <b>57-60</b> | <b>B</b> | PRF (mHz)                                                                        |                                  |
| <b>61-64</b> | <b>B</b> | Scan ID for SCAN SAR mode ( 1 - 5 )<br>except Wide Observation mode = 0          |                                  |
| <b>65-66</b> | <b>B</b> | Onboard Range compressed flag = 0<br>(0=no/1=yes)                                | The value of Level 1.0 is copied |
| <b>67-68</b> | <b>B</b> | Pulse (chirp) type designator = 0<br>0 : LINEAR FM CHIRP<br>1 : PHASE MODULATORS | The value of Level 1.0 is copied |
| <b>69-72</b> | <b>B</b> | Chirp length (nanoseconds)                                                       | The value of Level 1.0 is copied |
| <b>73-76</b> | <b>B</b> | Chirp constant coefficient (Hz) (nominal value)                                  | The value of Level 1.0 is copied |
| <b>77-80</b> | <b>B</b> | Chirp linear coefficient (Hz/micro-sec) (nominal value)                          | The value of Level 1.0 is copied |
| <b>81-84</b> | <b>B</b> | Chirp quadratic coefficient (Hz/micro-sec <sup>2</sup> ) (nominal value)         | The value of Level 1.0 is copied |
| <b>85-92</b> | <b>B</b> | spare = 0                                                                        | The value of Level 1.0 is copied |

# SignalDataRecord ( 5 / 7 )

| Bytes          | Format   | Description                                                                    | Contents                         |
|----------------|----------|--------------------------------------------------------------------------------|----------------------------------|
| <b>93-96</b>   | <b>B</b> | Receiver gain (dB) (nominal value)                                             | The value of Level 1.0 is copied |
| <b>97-100</b>  | <b>B</b> | Nought line flag<br>Effective line = 0<br>Invalid line (loss line) = 1         |                                  |
| <b>101-104</b> | <b>B</b> | Electronic antenna squint angle (millionths of degrees)                        |                                  |
| <b>105-108</b> | <b>B</b> | Antenna mechanical elevation angle from nadir (millionths of degrees)          |                                  |
| <b>109-112</b> | <b>B</b> | Electronic antenna squint angle (millionths of degrees)                        |                                  |
| <b>113-116</b> | <b>B</b> | Mechanical antenna squint angle (millionths of degrees)                        |                                  |
| <b>117-120</b> | <b>B</b> | Slant range to 1st data sample (meters)                                        |                                  |
| <b>121-124</b> | <b>B</b> | Data record window position (i.e. sample delay) (nanoseconds)<br>Level 1.1 = 0 |                                  |
| <b>125-128</b> | <b>B</b> | spare = 0                                                                      | The value of Level 1.0 is copied |

|F

**SignalDataRecord ( 6 / 7 )**

| Bytes          | Format     | Description                                                                                                                                             | Contents                         |
|----------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>129-132</b> | <b>B</b>   | PREFIX DATA-PLATFORM REFERENCE INFORMATION<br><br>Platform pos. parameters update flag = 0<br>(1=data in this section is an update, 0=data is a repeat) |                                  |
| <b>133-136</b> | <b>B</b>   | Platform latitude (millionths deg.) = 0                                                                                                                 | The value of Level 1.0 is copied |
| <b>137-140</b> | <b>B</b>   | Platform longitude (millionths deg.) = 0                                                                                                                | The value of Level 1.0 is copied |
| <b>141-144</b> | <b>B</b>   | Platform altitude (m) = 0                                                                                                                               | The value of Level 1.0 is copied |
| <b>145-148</b> | <b>B</b>   | Platform ground speed (cm/sec) = 0                                                                                                                      | The value of Level 1.0 is copied |
| <b>149-160</b> | <b>3B4</b> | Platform velocity X', Y', Z' (cm/sec) = 0                                                                                                               | The value of Level 1.0 is copied |
| <b>161-172</b> | <b>3B4</b> | Platform acceleration X', Y', Z' (cm/sec <sup>2</sup> ) = 0                                                                                             | The value of Level 1.0 is copied |
| <b>173-176</b> | <b>B</b>   | Platform track angle (millionths deg.) = 0                                                                                                              | The value of Level 1.0 is copied |
| <b>177-180</b> | <b>B</b>   | Platform track angle (millionths deg.) = 0                                                                                                              | The value of Level 1.0 is copied |

**SignalDataRecord ( 7 / 7 )**

| Bytes          | Format      | Description                                                                                                                                                            | Contents                         |
|----------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>181-184</b> | <b>B</b>    | Platform Pitch angle (millionths deg.) = 0                                                                                                                             | The value of Level 1.0 is copied |
| <b>185-188</b> | <b>B</b>    | Platform Roll angle (millionths deg.) = 0                                                                                                                              | The value of Level 1.0 is copied |
| <b>189-192</b> | <b>B</b>    | Platform Yaw angle (millionths deg.) = 0                                                                                                                               | The value of Level 1.0 is copied |
|                |             | PREFIX DATA-SENSOR/FACILITY SPECIFIC AUXILIARY DATA                                                                                                                    |                                  |
| <b>193-284</b> | <b>B92</b>  | Always blank (0) filled                                                                                                                                                | The value of Level 1.0 is copied |
| <b>285-288</b> | <b>B4</b>   | Counter of PALSAR frame = 0                                                                                                                                            |                                  |
| <b>289-388</b> | <b>B100</b> | PALSAR auxiliary data = 0                                                                                                                                              |                                  |
| <b>389-412</b> | <b>B24</b>  | Always blank (0) filled                                                                                                                                                | The value of Level 1.0 is copied |
|                |             | SAR RAW SIGNAL DATA                                                                                                                                                    |                                  |
| <b>413-i</b>   | <b>jBk</b>  | SAR Signal data consisting of Noise and Echo data. Where:<br>(i) -number of bytes of data + 412<br>(j) -number of pixels on this record<br>(k) -size of pixel in bytes |                                  |

ProcessedDataRecord ( 1 / 7 )

| Bytes       | Format   | Description                        | Contents |
|-------------|----------|------------------------------------|----------|
| <b>1-4</b>  | <b>B</b> | Record sequence number = 2, 3, ... |          |
| <b>5</b>    | <b>B</b> | 1st record sub-type code = 50      |          |
| <b>6</b>    | <b>B</b> | Record type code = 11              |          |
| <b>7</b>    | <b>B</b> | 2nd record sub-type code = 18      |          |
| <b>8</b>    | <b>B</b> | 3rd record sub-type code = 20      |          |
| <b>9-12</b> | <b>B</b> | Length of this record              |          |

ProcessedDataRecord ( 2 / 7 )

| Bytes | Format | Description                                                                                 | Contents |
|-------|--------|---------------------------------------------------------------------------------------------|----------|
|       |        | PREFIX DATA-GENERAL INFORMATION                                                             |          |
| 13-16 | B      | SAR image data line number = 1, 2, ...                                                      |          |
| 17-20 | B      | SAR image data record index = 1<br>(indicates the record sequence number in the image line) |          |
| 21-24 | B      | Actual count of left-fill pixels = 0                                                        |          |
| 25-28 | B      | Actual count of data pixels                                                                 |          |
| 29-32 | B      | Actual count of right-fill pixels = 0                                                       |          |

ProcessedDataRecord ( 3 / 7 )

| Bytes | Format | Description                                                                                                                                           | Contents |
|-------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|       |        | PREFIX DATA-SENSOR/PROCESSING PARAMETERS                                                                                                              |          |
| 33-36 | B      | Sensor parameters update flag = 0<br>(1=data in this section is an update, 0=data is a repeat)                                                        |          |
| 37-40 | B      | Sensor acquisition year (UT)<br>Scene start year                                                                                                      |          |
| 41-44 | B      | Sensor acquisition day of year (UT)<br>Scene start day of year                                                                                        |          |
| 45-48 | B      | Sensor acquisition milliseconds of day (UT) = 0                                                                                                       |          |
| 49-50 | B      | SAR channel indicator (sequence number in multi-channel SAR data)<br>where : single polarization = 1<br>dual polarization = 2<br>Polarimetry mode = 4 |          |
| 51-52 | B      | SAR channel code = 0<br>(0=L, 1=5, 2=C, 3=X, 4=KU and 5=KA channel)                                                                                   |          |
| 53-54 | B      | Transmitted polarization (0=H, 1=V)                                                                                                                   |          |
| 55-56 | B      | Received polarization (0=H, 1=V)                                                                                                                      |          |

ProcessedDataRecord ( 4 / 7 )

| Bytes          | Format   | Description                                       | Contents                |
|----------------|----------|---------------------------------------------------|-------------------------|
| <b>57-60</b>   | <b>B</b> | PRF (mHz)                                         | ScanSAR = 0             |
| <b>61-64</b>   | <b>B</b> | Scan ID for SCAN SAR mode = 0                     |                         |
| <b>65-68</b>   | <b>B</b> | Slant Range to 1st pixel (m)                      | In Geo-coded, set blank |
| <b>69-72</b>   | <b>B</b> | Slant Range to mid-pixel (m)                      |                         |
| <b>73-76</b>   | <b>B</b> | Slant Range to last-pixel (m)                     |                         |
| <b>77-80</b>   | <b>B</b> | Doppler centroid value at 1st pixel (1/1,000 Hz)  |                         |
| <b>81-84</b>   | <b>B</b> | Doppler centroid value at mid-pixel (1/1,000 Hz)  |                         |
| <b>85-88</b>   | <b>B</b> | Doppler centroid value at last pixel (1/1,000 Hz) |                         |
| <b>89-92</b>   | <b>B</b> | Azimuth FM rate of 1st pixel (Hz/msec)            |                         |
| <b>93-96</b>   | <b>B</b> | Azimuth FM rate of mid-pixel (Hz/msec)            |                         |
| <b>97-100</b>  | <b>B</b> | Azimuth FM rate of last pixel (Hz/msec)           |                         |
| <b>101-104</b> | <b>B</b> | Look angle of nadir (millionths of degrees) = 0   |                         |

|I

ProcessedDataRecord ( 5 / 7 )

| Bytes          | Format   | Description                                                                                                | Contents |
|----------------|----------|------------------------------------------------------------------------------------------------------------|----------|
| <b>105-108</b> | <b>B</b> | Azimuth squint angle (millionths of degrees) = 0                                                           |          |
| <b>109-128</b> | <b>B</b> | spare = 0<br><br>PREFIX DATA-GEOGRAPHIC REFERENCE INFO.                                                    |          |
| <b>129-132</b> | <b>B</b> | Geographic ref. Parameter update flag = 0<br>(1 = data in this section is an update, 0 = data is a repeat) |          |
| <b>133-136</b> | <b>B</b> | Latitude of 1st pixel (millionths of degrees) = 0                                                          |          |
| <b>137-140</b> | <b>B</b> | Latitude of mid-pixel (millionths of degrees) = 0                                                          |          |
| <b>141-144</b> | <b>B</b> | Latitude of last pixel (millionths of degrees) = 0                                                         |          |
| <b>145-148</b> | <b>B</b> | Longitude of 1st pixel (millionths of degrees) = 0                                                         |          |
| <b>149-152</b> | <b>B</b> | Longitude of mid-pixel (millionths of degrees) = 0                                                         |          |
| <b>153-156</b> | <b>B</b> | Longitude of last pixel (millionths of degrees) = 0                                                        |          |
| <b>157-160</b> | <b>B</b> | Northing of 1st pixel (m) = 0                                                                              |          |

ProcessedDataRecord ( 6 / 7 )

| Bytes          | Format     | Description                                                                                                                              | Contents |
|----------------|------------|------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>161-164</b> | <b>B</b>   | spare = 0                                                                                                                                |          |
| <b>165-168</b> | <b>B</b>   | Northing of last pixel (m) = 0                                                                                                           |          |
| <b>169-172</b> | <b>B</b>   | Easting of 1st pixel (m) = 0                                                                                                             |          |
| <b>173-176</b> | <b>B</b>   | spare = 0                                                                                                                                |          |
| <b>177-180</b> | <b>B</b>   | Easting of last pixel (m) = 0                                                                                                            |          |
| <b>181-184</b> | <b>B</b>   | Line heading (orientation of the perpendicular to the data line centre relative to true north)<br>(millionths of degrees) = 0            |          |
| <b>185-192</b> | <b>B</b>   | spare = 0                                                                                                                                |          |
|                |            | SAR PROCESSED DATA                                                                                                                       |          |
| <b>193-i</b>   | <b>jBk</b> | SAR processed data. Where :<br>(i) -number of bytes of data + 412<br>(j) -number of pixels on this record<br>(k) -size of pixel in bytes |          |

ProcessedDataRecord ( 7 / 7 )

| Bytes | Format     | Description                                                    | Contents |
|-------|------------|----------------------------------------------------------------|----------|
|       | <b>0*B</b> | <p>SUFFIX DATA</p> <p>Processing Facility specific details</p> |          |

# TrailerFileDescriptorRecord ( 1 / 10 )

| Bytes        | Format    | Description                                                                                                        | Contents                         |
|--------------|-----------|--------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>1-4</b>   | <b>B</b>  | Record sequence number = 1                                                                                         | The value of Level 1.0 is copied |
| <b>5</b>     | <b>B</b>  | 1st record sub-type code = 63                                                                                      | The value of Level 1.0 is copied |
| <b>6</b>     | <b>B</b>  | Record type code = 192                                                                                             | The value of Level 1.0 is copied |
| <b>7</b>     | <b>B</b>  | 2nd record sub-type code = 18                                                                                      | The value of Level 1.0 is copied |
| <b>8</b>     | <b>B</b>  | 3rd record sub-type code = 18                                                                                      | The value of Level 1.0 is copied |
| <b>9-12</b>  | <b>B</b>  | Length of this record = 720                                                                                        | The value of Level 1.0 is copied |
| <b>13-14</b> | <b>CH</b> | ASCII/EBCDIC flag = 'Ab' for ASCII                                                                                 | The value of Level 1.0 is copied |
| <b>15-16</b> | <b>CH</b> | Continuation flag ('Cb' if information is continued on the next text record, else 'bb' for no continuation) = 'bb' | The value of Level 1.0 is copied |
| <b>17-28</b> | <b>CH</b> | Format control document ID for this data file format (the ID of this document) = 'CEOS-SAR-CCT'                    | The value of Level 1.0 is copied |

# TrailerFileDescriptorRecord ( 2 / 10 )

| Bytes | Format | Description                                                                                                                                                           | Contents                            |
|-------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| 29-30 | CH     | Format control document revision level = 'bA'                                                                                                                         | The value of Level 1.0 is copied    |
| 31-32 | CH     | File design descriptor revision letter = 'bA'                                                                                                                         | The value of Level 1.0 is copied    |
| 33-44 | CH     | Logical volume generating facility software release and revision level<br>(i.e. name and version left justified) = 'NN.NNbbbbbbb'<br>1.00, 1.01, ..., 1.10, ..., 2.00 | The value of Level 1.0 is copied  A |
| 45-48 | I4     | File number = 'bbb1'                                                                                                                                                  | The value of Level 1.0 is copied    |

# TrailerFileDescriptorRecord ( 3 / 10 )

| Bytes        | Format    | Description                                                                                                                                                                                                                                                                                                                                            | Contents                                                                               |
|--------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>49-64</b> | <b>CH</b> | Referenced file name (16 characters indicating nature of the data, i.e. header, annotation, SAR product type, etc.) = 'MMNbSSSTFFFFbbbb'<br>MM : Mission ID (ALOS='AL') (*2)<br>N : Mission number (ALOS='1') (*2)<br>SSS : Sensor ID (PALSAR='PSR') (*2)<br>T : Processing Level Code (*1)<br>FFFF : File Type Code (*2)<br>SAR Trailer File = 'SART' | (*1)<br>'B' : Level 1.1<br>'C' : Level 1.5<br><br>(*2)The value of Level 1.0 is copied |

# TrailerFileDescriptorRecord ( 4 / 10 )

| Bytes          | Format    | Description                                        | Contents                         |
|----------------|-----------|----------------------------------------------------|----------------------------------|
| <b>65-68</b>   | <b>CH</b> | Record sequence and location type flag<br>= 'FSEQ' | The value of Level 1.0 is copied |
| <b>69-76</b>   | <b>I8</b> | Sequence number location<br>= 'bbbbbbb1'           | The value of Level 1.0 is copied |
| <b>77-80</b>   | <b>I4</b> | Sequence number field length<br>= 'bbb4'           | The value of Level 1.0 is copied |
| <b>81-84</b>   | <b>CH</b> | Record code and location type flag<br>= 'FTYP'     | The value of Level 1.0 is copied |
| <b>85-92</b>   | <b>I8</b> | Record code location<br>= 'bbbbbbb5'               | The value of Level 1.0 is copied |
| <b>93-96</b>   | <b>I4</b> | Record code field length<br>= 'bbb4'               | The value of Level 1.0 is copied |
| <b>97-100</b>  | <b>CH</b> | Record length and location type flag<br>= 'FLGT'   | The value of Level 1.0 is copied |
| <b>101-108</b> | <b>I8</b> | Record length location<br>= 'bbbbbbb9'             | The value of Level 1.0 is copied |

# TrailerFileDescriptorRecord ( 5 / 10 )

| Bytes          | Format    | Description                                       | Contents                         |
|----------------|-----------|---------------------------------------------------|----------------------------------|
| <b>109-112</b> | <b>I4</b> | Record length field length<br>= 'bbb4'            | The value of Level 1.0 is copied |
| <b>113-180</b> | <b>CH</b> | blanks                                            | The value of Level 1.0 is copied |
| <b>181-186</b> | <b>I6</b> | Number of data set summary records = 'bbbbbb0'    | The value of Level 1.0 is copied |
| <b>187-192</b> | <b>I6</b> | Data set summary record length = 'bbbbbb0'        | The value of Level 1.0 is copied |
| <b>193-198</b> | <b>I6</b> | Number of map projection data records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>199-204</b> | <b>I6</b> | Map projection record length = 'bbbbbb0'          | The value of Level 1.0 is copied |
| <b>205-210</b> | <b>I6</b> | Number of platform pos. data records = 'bbbbbb0'  | The value of Level 1.0 is copied |
| <b>211-216</b> | <b>I6</b> | Platform position record length = 'bbbbbb0'       | The value of Level 1.0 is copied |
| <b>217-222</b> | <b>I6</b> | Number of attitude data records = 'bbbbbb0'       | The value of Level 1.0 is copied |
| <b>223-228</b> | <b>I6</b> | Attitude data record length = 'bbbbbb0'           | The value of Level 1.0 is copied |
| <b>229-234</b> | <b>I6</b> | Number of radiometric data records = 'bbbbbb0'    | The value of Level 1.0 is copied |
| <b>235-240</b> | <b>I6</b> | Radiometric record length = 'bbbbbb0'             | The value of Level 1.0 is copied |

**TrailerFileDescriptorRecord ( 6 / 10 )**

| Bytes          | Format    | Description                                            | Contents                         |
|----------------|-----------|--------------------------------------------------------|----------------------------------|
| <b>241-246</b> | <b>I6</b> | Number of radiometric compensation records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>247-252</b> | <b>I6</b> | Radiometric compensation rec. length = 'bbbbbb0'       | The value of Level 1.0 is copied |
| <b>253-258</b> | <b>I6</b> | Number of data quality summary records = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>259-264</b> | <b>I6</b> | Data quality summary record length = 'bbbbbb0'         | The value of Level 1.0 is copied |
| <b>265-270</b> | <b>I6</b> | Number of data histograms records = 'bbbbbb0'          | The value of Level 1.0 is copied |
| <b>271-276</b> | <b>I6</b> | Data histogram record length = 'bbbbbb0'               | The value of Level 1.0 is copied |
| <b>277-282</b> | <b>I6</b> | Number of range spectra records = 'bbbbbb0'            | The value of Level 1.0 is copied |
| <b>283-288</b> | <b>I6</b> | Range spectra record length = 'bbbbbb0'                | The value of Level 1.0 is copied |
| <b>289-294</b> | <b>I6</b> | Number of DEM descriptor records = 'bbbbbb0'           | The value of Level 1.0 is copied |
| <b>295-300</b> | <b>I6</b> | DEM descriptor record length = 'bbbbbb0'               | The value of Level 1.0 is copied |
| <b>301-306</b> | <b>I6</b> | Number of Radar par. update records = 'bbbbbb0'        | The value of Level 1.0 is copied |
| <b>307-312</b> | <b>I6</b> | Radar par. update record length = 'bbbbbb0'            | The value of Level 1.0 is copied |

# TrailerFileDescriptorRecord ( 7 / 10 )

| Bytes          | Format    | Description                                   | Contents                         |
|----------------|-----------|-----------------------------------------------|----------------------------------|
| <b>313-318</b> | <b>I6</b> | Number of Annotation data records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>319-324</b> | <b>I6</b> | Annotation data record length = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>325-330</b> | <b>I6</b> | Number of Det. processing records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>331-336</b> | <b>I6</b> | Det. processing record length = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>337-342</b> | <b>I6</b> | Number of Calibration records = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>343-348</b> | <b>I6</b> | Calibration record length = 'bbbbbb0'         | The value of Level 1.0 is copied |
| <b>349-354</b> | <b>I6</b> | Number of GCP records = 'bbbbbb0'             | The value of Level 1.0 is copied |
| <b>355-360</b> | <b>I6</b> | GCP record length = 'bbbbbb0'                 | The value of Level 1.0 is copied |
| <b>361-420</b> | <b>I6</b> | blanks                                        | The value of Level 1.0 is copied |

**TrailerFileDescriptorRecord ( 8 / 10 )**

| Bytes          | Format    | Description                                     | Contents                         |
|----------------|-----------|-------------------------------------------------|----------------------------------|
| <b>421-426</b> | <b>I6</b> | Number of facility data (1) records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>427-432</b> | <b>I8</b> | Facility data (1) record length = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>435-440</b> | <b>I6</b> | Number of facility data (2) records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>441-448</b> | <b>I8</b> | Facility data (2) record length = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>449-454</b> | <b>I6</b> | Number of facility data (3) records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>455-462</b> | <b>I8</b> | Facility data (3) record length = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>463-468</b> | <b>I6</b> | Number of facility data (4) records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>469-476</b> | <b>I8</b> | Facility data (4) record length = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>477-482</b> | <b>I6</b> | Number of facility data (5) records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>483-490</b> | <b>I8</b> | Facility data (5) record length = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>491-496</b> | <b>I6</b> | Number of facility data (6) records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>497-504</b> | <b>I8</b> | Facility data (6) record length = 'bbbbbb0'     | The value of Level 1.0 is copied |

# TrailerFileDescriptorRecord ( 9 / 10 )

| Bytes          | Format    | Description                                      | Contents                         |
|----------------|-----------|--------------------------------------------------|----------------------------------|
| <b>505-510</b> | <b>I6</b> | Number of facility data (7) records = 'bbbbbb0'  | The value of Level 1.0 is copied |
| <b>511-518</b> | <b>I8</b> | Facility data (7) record length = 'bbbbbb0'      | The value of Level 1.0 is copied |
| <b>519-524</b> | <b>I6</b> | Number of facility data (8) records = 'bbbbbb0'  | The value of Level 1.0 is copied |
| <b>525-532</b> | <b>I8</b> | Facility data (8) record length = 'bbbbbb0'      | The value of Level 1.0 is copied |
| <b>533-538</b> | <b>I6</b> | Number of facility data (9) records = 'bbbbbb0'  | The value of Level 1.0 is copied |
| <b>539-546</b> | <b>I8</b> | Facility data (9) record length = 'bbbbbb0'      | The value of Level 1.0 is copied |
| <b>547-552</b> | <b>I6</b> | Number of facility data (10) records = 'bbbbbb0' | The value of Level 1.0 is copied |
| <b>553-560</b> | <b>I8</b> | Facility data (10) record length = 'bbbbbb0'     | The value of Level 1.0 is copied |
| <b>561-566</b> | <b>I6</b> | Number of facility data (11) records = 'bbbbbb0' |                                  |
| <b>567-574</b> | <b>I8</b> | Facility data (11) record length = 'bbbbbb0'     |                                  |

# TrailerFileDescriptorRecord ( 10 / 10 )

| Bytes   | Format | Description                                                                                                                                                   | Contents                         |
|---------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 575-580 | I6     | Number of low resolution image data records (Level 1.1, 1.5)<br>Wide Observation Mode = 'bbbbbb0'<br>Except Wide Observation Mode = 'bbbbbb1'                 |                                  |
| 581-586 | I6     | low resolution image data record length (Level 1.1, 1.5)<br>Wide Observation Mode = 'bbbbbb0'<br>Except Wide Observation Mode = variable                      |                                  |
| 587-592 | I6     | Number of pixels of low resolution image data (Level 1.1, 1.5)<br>Wide Observation Mode = 'bbbbbb0'<br>Except Wide Observation Mode = variable                |                                  |
| 593-598 | I6     | Number of lines of low resolution image data (Level 1.1, 1.5)<br>Wide Observation Mode = 'bbbbbb0'<br>Except Wide Observation Mode = variable                 |                                  |
| 599-604 | I6     | Number of bytes per one sample of low resolution image data (Level 1.1, 1.5)<br>Wide Observation Mode = 'bbbbbb0'<br>Except Wide Observation Mode = 'bbbbbb2' |                                  |
| 605-720 | CH     | blanks                                                                                                                                                        | The value of Level 1.0 is copied |

**LowResolutionImageDataRecord ( 1 / 1 )**

| Bytes      | Format     | Description                                                                                                                                                                | Contents                     |
|------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>1-I</b> | <b>jBk</b> | <p>Low resolution image data for 16bit. Where :</p> <p>(i) -number of bytes of data</p> <p>(j) -number of pixels on this record</p> <p>(k) -size of pixel in bytes = 2</p> | Except Wide Observation Mode |

#### 4 Summary Information

The following pages show the record formats for the Summary Information.

## Summary Information (PALSAR Level 1.1/1.5) (1/4)

| No. | Section                   | Name of Items                             | Keyword                           | Contents                                                                                                                                                                                                                                                                                               |
|-----|---------------------------|-------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Ordered Information (Odi) | Number of Product Management              | Odi_ProductManagementNo           | XYNNNNN X: Code distinguished the inquiry office<br>YY: The year of receipted orders (Last two digits of A.D.year)<br>NNNNN: Running numbers(00001 - 99999)<br>(Refer to NCX-000048)                                                                                                                   |
| 2   |                           | Sub-number of product management          | Odi_ProductManagementBranchNo     | XXX XXX: 001 - 999 (Refer to NCX-000048)                                                                                                                                                                                                                                                               |
| 3   | Appointed Scene (Scs)     | Scene ID                                  | Scs_SceneID                       | AABBBCDDDDDEEEEE AA: Mission type<br>BBB : Sensor type<br>C: Supplemental remarks of sensor type<br>(S:Wide observation mode, P:Except wide observation mode)<br>DDDDD: Total calculated orbit number of the scene center<br>EEEE : Frame number of the scene center                                   |
| 4   |                           | Amount of scene shift                     | Scs_SceneShift                    | -5 - 4<br>(No sign in case of zero and plus)                                                                                                                                                                                                                                                           |
| 5   | Appointed Product (Pds)   | Product ID                                | Pds_ProductID                     | ABBBCDE A: Observation mode<br>BBB: Processing level<br>C: Processing option<br>D : Map projection<br>E: Ascending Node                                                                                                                                                                                |
| 6   |                           | Resampling method                         | Pds_ResamplingMethod              | NN/BL/CC (only case of Level 1.5)<br>Nearest neighbor/Bi-linear/Cubic convolution                                                                                                                                                                                                                      |
| 7   |                           | Number of UTM zone                        | Pds_UTM_ZoneNo                    | 1 - 60 (only case of Level 1.5 and UTM in map projection)                                                                                                                                                                                                                                              |
| 8   |                           | PS Reference Latitude                     | Pds_PS_ReferenceLatitude          | In case of except wide observation mode;<br>The Northern Hemisphere: 25.000<=Reference Latitude<=90.000<br>The Southern Hemisphere: -90.000<=Reference Latitude<=-25.000<br>In case of wide observation mode; -90.000<=Reference Latitude<=90.000<br>(only case of Level 1.5 and PS in map projection) |
| 9   |                           | PS Reference Longitude                    | Pds_PS_ReferenceLongitude         | -179.999<=Reference Longitude<=180.000<br>(only case of Level 1.5 and PS in map projection)                                                                                                                                                                                                            |
| 10  |                           | LCC Reference Latitudinal Line 1 Latitude | Pds_LCC_ReferenceLatitudinalLine1 | -90.000<Reference Longitude<90.000<br>(only case of Level 1.5 and LCC in map projection)                                                                                                                                                                                                               |
| 11  |                           | LCC Reference Latitudinal Line 2 Latitude | Pds_LCC_ReferenceLatitudinalLine2 | -90.000<Reference Longitude<90.000<br>(only case of Level 1.5 and LCC in map projection)                                                                                                                                                                                                               |
| 12  |                           | Direction of Map                          | Pds_MapDirection                  | MapNorth (only case of Level 1.5/Geo-coded)                                                                                                                                                                                                                                                            |
| 13  |                           | LCC Origin Latitude                       | Pds_LCC_OriginLatitude            | -90.000<=Origin Latitude<=90.000<br>(only case of Level 1.5 and LCC in map projection)                                                                                                                                                                                                                 |
| 14  |                           | LCC Origin Longitude                      | Pds_LCC_OriginLongitude           | -179.999<=Origin Longitude<=180.000<br>(only case of Level 1.5 and LCC in map projection)                                                                                                                                                                                                              |
| 15  |                           | Pixel Spacing                             | Pds_PixelSpacing                  | 6.25/12.5/100 (Unit: m) (only case of Level 1.5)                                                                                                                                                                                                                                                       |

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## Summary Information (PALSAR Level 1.1/1.5) (2/4)

| No. | Section                             | Name of Items                               | Keyword                            | Contents                                                                                                                                                                                                  |
|-----|-------------------------------------|---------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16  | Appointed Product (Pds) (continued) | Accuracy of used orbit data                 | Pds_OrbitDataPrecision             | Precision/RARR_Determine/RARR_Predict<br>Precision: ALOS High Precision Orbit Information<br>RARR_Determine: ALOS Orbit Information (Decision)<br>RARR_Predict: ALOS Orbit Information (Preliminary)      |
| 17  |                                     | Accuracy of used attitude data              | Pds_AttitudeDataPrecision          | Standard<br>Standard: Standard attitude determination system (Onboard)                                                                                                                                    |
| 18  | Image Information (Img)             | Scene center date and time                  | Img_SceneCenterDateTime            | YYYYMMDDbHH:MM:SS.TTT(UT)<br>YYYY:A.D. year MM:Month(01- 12) DD:Day(01 - 31) HH:Hour(00 - 23)<br>MM:Minute(00 - 59) SS:Second(00 - 60) TTT:Milisecond(000 - 999)<br>(ss=60 is only case of a leap second) |
| 19  |                                     | Scene start date and time                   | Img_SceneStartDateTime             | YYYYMMDDbHH:MM:SS.TTT(UT)<br>YYYY:A.D. year MM:Month(01- 12) DD:Day(01 - 31) HH:Hour(00 - 23)<br>MM:Minute(00 - 59) SS:Second(00 - 60) TTT:Milisecond(000 - 999)<br>(ss=60 is only case of a leap second) |
| 20  |                                     | Scene end date and time                     | Img_SceneEndDateTime               | YYYYMMDDbHH:MM:SS.TTT(UT)<br>YYYY:A.D. year MM:Month(01- 12) DD:Day(01 - 31) HH:Hour(00 - 23)<br>MM:Minute(00 - 59) SS:Second(00 - 60) TTT:Milisecond(000 - 999)<br>(ss=60 is only case of a leap second) |
| 21  |                                     | Latitude of image scene center              | Img_ImageSceneCenterLatitude       | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                      |
| 22  |                                     | Longitude of image scene center             | Img_ImageSceneCenterLongitude      | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                    |
| 23  |                                     | Latitude of image scene left upper corner   | Img_ImageSceneLeftTopLatitude      | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                      |
| 24  |                                     | Longitude of image scene left upper corner  | Img_ImageSceneLeftTopLongitude     | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                    |
| 25  |                                     | Latitude of image scene right upper corner  | Img_ImageSceneRightTopLatitude     | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                      |
| 26  |                                     | Longitude of image scene right upper corner | Img_ImageSceneRightTopLongitude    | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                    |
| 27  |                                     | Latitude of image scene left lower corner   | Img_ImageSceneLeftBottomLatitude   | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                      |
| 28  |                                     | Longitude of image scene left lower corner  | Img_ImageSceneLeftBottomLongitude  | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                    |
| 29  |                                     | Latitude of image scene right lower corner  | Img_ImageSceneRightBottomLatitude  | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                      |
| 30  |                                     | Longitude of frame scene right lower corner | Img_ImageSceneRightBottomLongitude | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                    |

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Summary Information (PALSAR Level 1.1/1.5) (3/4)

| No. | Section                                | Name of Items                                                                                                     | Keyword                                     | Contents                                                                                                                                                                                                                                                                                                          |
|-----|----------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 31  | Image Information<br>(Img) (continued) | Latitude of frame scene center                                                                                    | Img_FrameSceneCenterLatitude                | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                              |
| 32  |                                        | Longitude of frame scene center                                                                                   | Img_FrameSceneCenterLongitude               | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                            |
| 33  |                                        | Latitude of frame scene left upper corner                                                                         | Img_FrameSceneLeftTopLatitude               | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                              |
| 34  |                                        | Longitude of frame scene left upper corner                                                                        | Img_FrameSceneLeftTopLongitude              | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                            |
| 35  |                                        | Latitude of frame scene right upper corner                                                                        | Img_FrameSceneRightTopLatitude              | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                              |
| 36  |                                        | Longitude of frame scene right upper corner                                                                       | Img_FrameSceneRightTopLongitude             | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                            |
| 37  |                                        | Latitude of frame scene left lower corner                                                                         | Img_FrameSceneLeftBottomLatitude            | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                              |
| 38  |                                        | Longitude of frame scene left lower corner                                                                        | Img_FrameSceneLeftBottomLongitude           | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                            |
| 39  |                                        | Latitude of frame scene right lower corner                                                                        | Img_FrameSceneRightBottomLatitude           | -90.000 - 90.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                              |
| 40  |                                        | Longitude of frame scene right lower corner                                                                       | Img_FrameSceneRightBottomLongitude          | -179.999 - 180.000 (degree) (case of Level 1.5 processing)<br>No abbreviation down to three decimals/ No sign in case of zero and plus                                                                                                                                                                            |
| 41  |                                        | Off Nadir Angle                                                                                                   | Img_OffNadirAngle                           | NN.N (degree)                                                                                                                                                                                                                                                                                                     |
| 42  | Product Information<br>(Pdi)           | Size of product data                                                                                              | Pdi_ProductDataSize                         | 0.0 - 9999.9 (Unit: Mbytes=1024Kbyte)                                                                                                                                                                                                                                                                             |
| 43  |                                        | Number of Level 1.1/1.5 product files                                                                             | Pdi_CntOfL15ProductFileName                 | High resolution mode (single polarization): 4 files<br>High resolution mode (dual polarization): 5 files<br>Direct down link mode: 4 files<br>Wide observation mode: 4 files<br>Polarimetry mode: 7 files                                                                                                         |
| 44  |                                        | Name of product file created Level 1.1/1.5 processing<br>(This item will be prepared of number of product files.) | Pdi_Pdi_L15ProductFileNamenn<br>nn: 01 ~ 99 | Volume Directory File VOL-SSSSSSSSSSSSSS-PPPPPPP<br>Leader File LED-SSSSSSSSSSSSSS-PPPPPPP<br>Image File IMG-XX-SSSSSSSSSSSSSS-PPPPPPP<br>Trailer File TRL-SSSSSSSSSSSSSS-PPPPPPP<br>SSSSSSSSSSSSSS: Scene ID<br>PPPPPPP: ProductID<br>XX: Polarization (HH,HV,VH,VV) (First is transmitter, second is receiving) |
| 45  |                                        | Bit / Pixel                                                                                                       | Pdi_BitPixel                                | NN "16": Level 1.5 (only case of Level 1.5)                                                                                                                                                                                                                                                                       |
| 46  |                                        | Number of pixels                                                                                                  | Pdi_NoOfPixels                              | 0 - 99999                                                                                                                                                                                                                                                                                                         |
| 47  |                                        | Number of lines                                                                                                   | Pdi_NoOfLines                               | 0 - 99999                                                                                                                                                                                                                                                                                                         |
| 48  |                                        | Product format                                                                                                    | Pdi_ProductFormat                           | CEOS: Fixed                                                                                                                                                                                                                                                                                                       |

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## Summary Information (PALSAR Level 1.1/1.5) (4/4)

| No. | Section                         | Name of Items                             | Keyword                            | Contents                                                                                                                                                                                                                                          |
|-----|---------------------------------|-------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 49  | Result of automatic check (Ach) | Time system data status                   | Ach_TimeCheck                      | OK/NG<br>OK: GSP time system, NG:DMS time system                                                                                                                                                                                                  |
| 50  |                                 | Attitude determination system data status | Ach_AttitudeCheck                  | OK/NG<br>OK: Precision attitude determination system,<br>NG: Standard attitude determination system                                                                                                                                               |
| 51  |                                 | Absolute navigation status                | Ach_AbsoluteNavigationStatus       | OK/NG                                                                                                                                                                                                                                             |
| 52  |                                 | House keeping data status                 | Ach_HouseKeepingDataCheck          | OK/NG<br>NG: NG is checked out in check items                                                                                                                                                                                                     |
| 53  |                                 | Orbit data status                         | Ach_OrbitCheck                     | OK/NG<br>Result of onboard limit check                                                                                                                                                                                                            |
| 54  |                                 | Onboard PCD attitude status               | Ach_OnBoardAttitudeCheck           | OK/NG                                                                                                                                                                                                                                             |
| 55  |                                 | Loss lines status                         | Ach_LossLines                      | OK/NG<br>NG: Rate of loss lines is over threshold                                                                                                                                                                                                 |
| 56  |                                 | PRF change status                         | Ach_PRF_Check                      | OK/FAIR/NG<br>OK : PRF does not change in a scene.<br>FAIR : PRF changes in a scene. Operator does not need to inspect the image.<br>NG : PRF changes in a scene. Operator needs to inspect the image.                                            |
| 57  |                                 | Calibration data including status         | Ach_CalibrationDataCheck           | OK/FAIR/NG<br>OK : Calibration data are not included in a scene.<br>FAIR : Calibration data are included in a scene. Operator does not need to inspect the image.<br>NG : Calibration data are included in a scene. Operator needs to inspect the |
| 58  | Version (Ver)                   | OS (Linux)                                | Ver_OS_VersionInDataProcessingUnit | XX----XX Version of operating system in the Data Processing Unit                                                                                                                                                                                  |
| 59  | Result Information (Rad)        | Practice result code                      | Rad_PracticeResultCode             | 00: Passing<br>01: Passing for this time by operator inspection<br>02: Conditional passing ( with passed automatic check)<br>03: Conditional passing ( with failed automatic check)                                                               |
| 60  |                                 | Processed host name                       | Rad_ProcessedHostName              | XXXXXXXXX (Host name used for data processing)                                                                                                                                                                                                    |
| 61  |                                 | Number of CDR                             | Rad_NoOfCDR                        | N: 1 - 9 (Number of CDR made case of output appointment is "CD-R")                                                                                                                                                                                |
| 62  | Label Information (Lbi)         | Satellite name                            | Lbi_Satellite                      | ALOS (Fixed)                                                                                                                                                                                                                                      |
| 63  |                                 | Sensor name                               | Lbi_Sensor                         | PALSAR (Fixed)                                                                                                                                                                                                                                    |
| 64  |                                 | Processing Level                          | Lbi_ProcessLevel                   | xxx                                                                                                                                                                                                                                               |
| 65  |                                 | Processed facility name                   | Lbi_ProcessFacility                | HEOC (Fixed)                                                                                                                                                                                                                                      |
| 66  |                                 | Observation date                          | Lbi_ObservationDate                | YYYYMMDD                                                                                                                                                                                                                                          |

C

E