



Maintenance and Operations of Earth Observation

Table with 4 columns: Title, Contract Ref., Document Ref., Consortium Ref., Issue, Rev., Date. Contains document metadata.



TITLE: ENVISAT-1 PRODUCTS SPECIFICATIONS
VOLUME 05: PRODUCT STRUCTURES

WRITTEN BY: Gianni Sotis (with handwritten signature)
(signature / date)

CHECKED BY:

APPROVED BY: Thorsten Fehr

AUTHORISED BY: Pascal Lecomte

DOCUMENT CATEGORY: [7] Approval [ ] Review [ ] Information

ESA APPROVAL:

SUMMARY: This document specifies the ENVISAT-1 products.



## Maintenance and Operations of Earth Observation

Title:	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
Contract Ref.:	ESA/Esrin 19049/05/I-OL		
Document Ref.:	PO-RS-MDA-GS-2009	Issue: 3	Rev.: D
Consortium Ref.:	OSME-DPQC-SEDA-RS-07-0544	Date:	22/11/2007



**THIS PAGE INTENTIONALLY LEFT BLANK**



## Maintenance and Operations of Earth Observation

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



### CHANGE RECORD

ISSUE	REVISION	DATE	CHANGE STATUS	ORIGIN
1	A	12/01/96	Issue 1	
1	B	16/02/96	<p>SCR #16, CR #16 Issue 1, Revision B</p> <p>Reason for Change:</p> <p>Updated to reflect information in PO-TN-ESA-GS-0381 and to address RIDs of Feb. 2/96 pertaining to the Level 0 structure. MPH, SPH, DSD, and DSR structures modified.</p> <p>Table added showing generalized Level 0 product structure.</p> <p>RIDs Addressed:</p> <p>ESA/0001: FEP header defined ESA/0002: PF-Host time stamp clarified ESA/0004: Processing PCD added ESA/0006: AF PCD ADS and DSD added ESA/0007: page A-3 updated ESA/0008: page B-3 updated ESA/0009: Table 8.1.1 modified ESA/0011: TBD changed to Range/Doppler ESA/0013: FEP header defined ESA/0014: Table 8.4.7.4-2 corrected CSF/1: filename in MPH corrected CSF/2: page A-3 updated CSF/3: MPH PCD information updated</p>	



## Maintenance and Operations of Earth Observation

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



			CSF/5: DSD added to Level 0 SPH CSF/6: Section on AATSR updated and re-issued CSF/8: AATSR_O Summary Sheet updated	
1	C	04/04/96	SCR #38, CR #38 Issue 1, Revision C  Reason for Change: Updated Sections 1-6, 17 and Annex A to reflect changes discussed at the Products Review Meeting #1, March 5-8, 1996, as per action item "AI MDA 6 April 96" from PO-MN-ESA-00416, Pg. 35.	Products Review Meeting #1
2	A	20/05/96	SCR #71, CR #71 Issue 2  Separate volume created.  Minor updates added.	
2	B	02/09/96	SCR #102, CR #102 Issue 2, Revision B  Reason for Change: New ASCII format for MPH and DSD.  Minor updates added.	Products Review Meeting #2
3	A	10/02/97	SCR #133, CR #133 Issue 3  Reason for Change: Updated due to ESA RIDs received 06/01/97 (fax DPD/JMJ/ENV, 0021/97).	ESA RIDs



## Maintenance and Operations of Earth Observation

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



3	B	19/06/97	SCR #169, CR #169 Issue 3, Revision B  Reason for Change:  Attachment flag strategy explained in greater detail.  Minor clarifications added.  Physical Medium section removed, as information was not useful. Section may be re-inserted when physical medium strategy becomes better defined.	Products Review Meeting #3
3	C	16/10/98	SCR #218, CR #218 Issue 3, Revision C  Reason for Change:  Updated for the following SPRs: SPR-42000-0190-CSF to SPR-42000-0192-CSF	
3	D	23/11/2007	OSV definition update for MPH of L0, L1 and L2 products. Note: OSV in MPH of ADF is only made of "0" entries, equivalent to not used.	



## Maintenance and Operations of Earth Observation

Title:	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
Contract Ref.:	ESA/Esrin 19049/05/I-OL		
Document Ref.:	PO-RS-MDA-GS-2009	Issue: 3	Rev.: D
Consortium Ref.:	OSME-DPQC-SEDA-RS-07-0544	Date:	22/11/2007



**THIS PAGE INTENTIONALLY LEFT BLANK**



## Maintenance and Operations of Earth Observation



Title:	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
Contract Ref.:	ESA/Esrin 19049/05/I-OL		
Document Ref.:	PO-RS-MDA-GS-2009	Issue: 3	Rev.: D
Consortium Ref.:	OSME-DPQC-SEDA-RS-07-0544	Date:	22/11/2007



---

### REGISTER OF CHANGES

#### Affected pages:

changes from 3C to 3D impact in general all pages for whole document format conversion.

In particular it has been updated note 6 at page 27 regarding OSV determination.

<b>Title:</b>	<b>ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES</b>		
<b>Contract Ref.:</b>	<b>ESA/Esrin 19049/05/I-OL</b>		
<b>Document Ref.:</b>	<b>PO-RS-MDA-GS-2009</b>	<b>Issue: 3</b>	<b>Rev.: D</b>
<b>Consortium Ref.:</b>	<b>OSME-DPQC-SEDA-RS-07-0544</b>	<b>Date:</b>	<b>22/11/2007</b>



## TABLE OF CONTENTS

5	PRODUCT STRUCTURES .....	13
5.1	GENERALIZED PRODUCT STRUCTURE.....	13
5.1.1	ASCII and Binary Structures .....	13
5.1.1.1	ASCII Header Conventions .....	13
5.2	MAIN PRODUCT HEADER .....	17
5.2.1	Contents .....	17
5.2.1.1	Product Identification Information.....	17
5.2.1.2	Information Regarding Data Acquisition and Processing.....	17
5.2.1.3	Information on Time of Data .....	17
5.2.1.4	Information on ENVISAT Orbit and Position .....	17
5.2.1.5	SBT to UTC Conversion Information.....	17
5.2.1.6	Product Confidence Data .....	17
5.2.1.7	Product Size Information .....	17
5.2.2	Format .....	17
5.3	SPECIFIC PRODUCT HEADER.....	30
5.3.1	Contents .....	30
5.3.2	Format .....	30
5.4	DATA SET DESCRIPTORS.....	30
5.4.1	Contents .....	30
5.4.2	Format .....	30
5.4.3	Example DSDs .....	32
5.4.3.1	DSD Pointing to a Data Set.....	33
5.4.3.2	DSD Referencing a File .....	33
5.4.3.3	DSD Not Used .....	33
5.4.3.4	Spare DSD.....	34
5.4.3.5	DSD for a Missing Data Set or File .....	34
5.5	THE DATA SET.....	35



## Maintenance and Operations of Earth Observation



<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007




---

5.5.1	Contents .....	35
5.5.2	Format .....	35



**Maintenance and Operations of Earth Observation**

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



**LIST OF FIGURES**

**Figure 5.1-1 Generalized Product Structure ..... 16**

**Figure 5.2.2-1 Example MPH..... 29**

**Figure 5.5.2-1 Example of Attachment Flag Usage..... 37**



## Maintenance and Operations of Earth Observation



<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



### LIST OF TABLES

<b>Table 5.2.2-1 Main Product Header .....</b>	<b>18</b>
<b>table 5.4.2-1 General DSD Format .....</b>	<b>31</b>



## Maintenance and Operations of Earth Observation

Title:	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
Contract Ref.:	ESA/Esrin 19049/05/I-OL		
Document Ref.:	PO-RS-MDA-GS-2009	Issue: 3	Rev.: D
Consortium Ref.:	OSME-DPQC-SEDA-RS-07-0544	Date:	22/11/2007



**THIS PAGE INTENTIONALLY LEFT BLANK**



## Maintenance and Operations of Earth Observation

Title:	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
Contract Ref.:	ESA/Esrin 19049/05/I-OL		
Document Ref.:	PO-RS-MDA-GS-2009	Issue: 3	Rev.: D
Consortium Ref.:	OSME-DPQC-SEDA-RS-07-0544	Date:	22/11/2007



## 5 PRODUCT STRUCTURES

This section outlines the basic structures used to form the products, and the physical media characteristics upon which products are stored.

### 5.1 GENERALIZED PRODUCT STRUCTURE

ENVISAT products will all follow a generalized structure consisting of:

1. the Main Product Header (MPH);
2. a Specific Product Header (SPH) containing information specific to the whole product plus one or more Data Set Descriptors (DSDs) which describe individual Data Sets;
3. One or more Data Sets (DSs), each consisting of one or more Data Set Records (DSRs).

This structure was previously introduced in Volume 3. A diagram of the ENVISAT Product structure is shown in Figure 5.1-2.

#### 5.1.1 ASCII and Binary Structures

The following convention has been defined for ENVISAT products:

- MPH and SPH (including DSDs) headers are produced in ASCII format using a keyword-value-terminator approach. The purpose of this method is to create header structures that are self-documenting, understandable, and easily readable by the user. The details of the method are described further below.
- Data Sets which follow the MPH and SPH are in mixed ascii-binary format. The purpose of using this format is to reduce the size of the detailed data contained in the data sets. Note that ASCII strings may occur in the Data Sets, but they are not surrounded by quotation marks as in the MPH and SPH structures.

##### 5.1.1.1 ASCII Header Conventions

The MPH and SPH of ENVISAT products follow the following conventions:

1. Headers use only ASCII characters. For a full list of allowable ASCII characters refer to ANNEX A.
2. They are fixed size structures (i.e. the SPH may vary across products, but within each product it is a fixed number of bytes long).
3. Each entry in the MPH and SPH will follow a keyword-value<units>-terminator



## Maintenance and Operations of Earth Observation



<b>Title:</b>	<b>ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES</b>		
<b>Contract Ref.:</b>	<b>ESA/Esrin 19049/05/I-OL</b>		
<b>Document Ref.:</b>	<b>PO-RS-MDA-GS-2009</b>	<b>Issue: 3</b>	<b>Rev.: D</b>
<b>Consortium Ref.:</b>	<b>OSME-DPQC-SEDA-RS-07-0544</b>	<b>Date:</b>	<b>22/11/2007</b>



structure.

4. **KEYWORDS:** Keywords are limited to the set of ASCII characters which include the capital english alphabet [A...Z], and the numbers [0...9]. The only other characters allowed in a keyword is the underscore (\_), and the equal sign (=). A keyword is a single word, or several words connected by underscore characters, followed by an equal sign.
5. **VALUES:** All values are expressed in ASCII format and follow immediately after the equal sign in the keyword (i.e. no white space in between keyword and value). Values may be of two classes: numeric-values, or string-values. Numeric-values are those which would normally be expressed as an integer or floating point value. The conversion of these values into a fixed size ASCII representation is described in ANNEX A. String-values are those values which would normally be expressed in ASCII characters regardless of their location in the product. String values fall into two types: single character entries, and multi-character entries. Multi-character entries must be placed within double quotes (“ ”) in the MPH or SPH. The string within these quotes may use any of the allowable ASCII character set. Single value characters do not require quotation marks, but are limited to the characters [A..Z], [a..z] and [0..9].
6. **UNITS:** The use of units is required for numeric-values unless the value has no units or the unit type is inherently obvious. For numeric-values which do not require units and string-values, the value is followed directly by the terminator character and no units entry is included. When units are deemed necessary, they are placed within angled braces (< >) directly following the last character of the value to which the units apply. No white space is left between the value and the first angled brace, nor is any white space left between the first angled brace and the first character of the units expression. Finally, no white space is left between the last character of the units expression and the closing angled brace. Within the braces, the units expression may use any allowable ASCII characters and be of any length.
7. **TERMINATOR:** The terminator character is placed directly after the closing angled brace of the units for entries which have units, or directly after the last character in the value for entries which do not have units attached to them. The terminator value for ENVISAT products is the ASCII newline character (character code 10 in Table A.2.1-1). The use of this terminator allows the MPH/SPH structure to be displayed in an easily readable format (one entry per line) on most UNIX text editors<sup>1</sup>.

<sup>1</sup> Note: The use of a single newline character to terminate an ASCII line is a UNIX convention. Some DOS and Apple text editors use both a carriage return and a newline character to terminate a line (ASCII codes 13 and 10 respectively). If such an editor is used to read this header, the header will appear as a continuous line of text which will have to be parsed by the user.





## Maintenance and Operations of Earth Observation

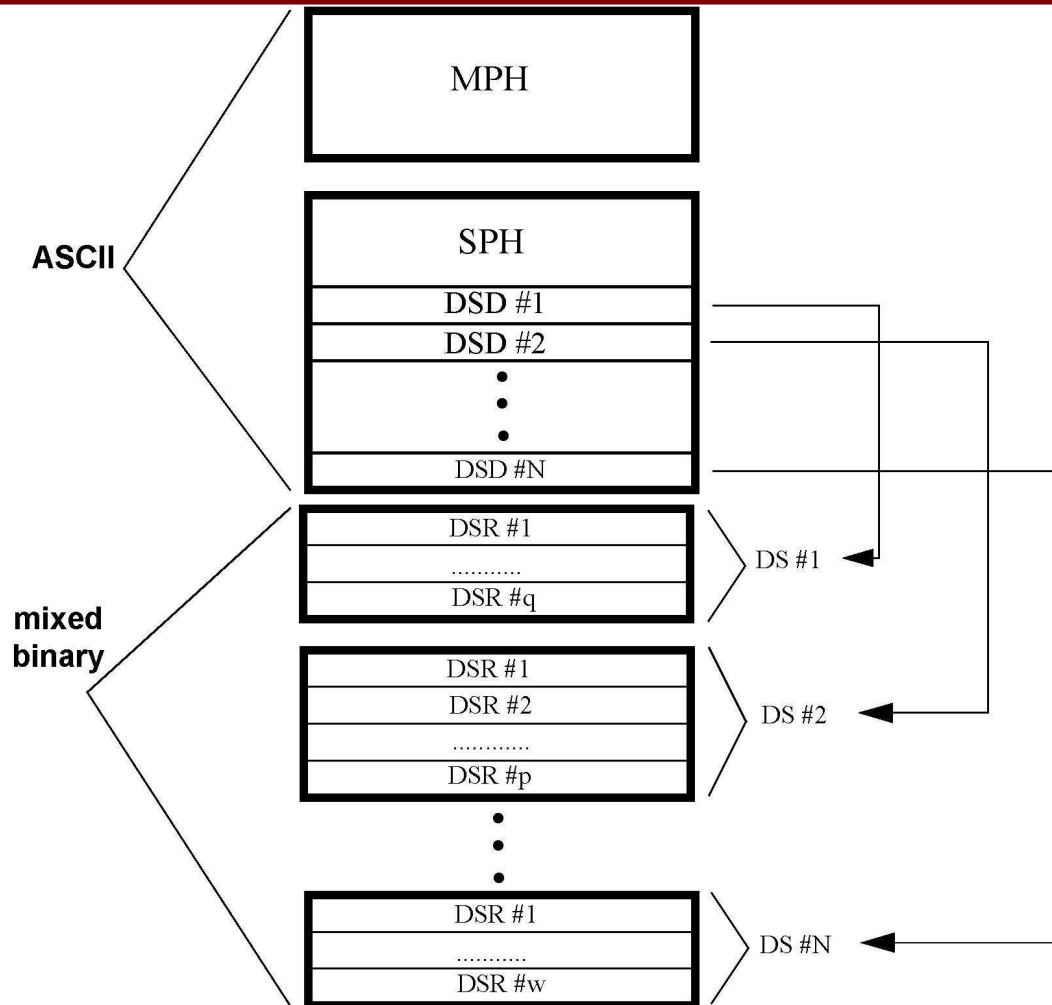
<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



8. All ASCII string entries are left-justified within the quotation marks. Therefore, if the string is shorter than the number of characters allocated for it, blank-space ASCII characters are placed after the last character in the string, but before the closing quotation mark.

Note that in the data definitions in this document, the notation  $\emptyset$  is used to indicate the inclusion of an ASCII blank-space character (ASCII character 32).

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



**Figure 5.1-1 Generalized Product Structure**

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



## 5.2 MAIN PRODUCT HEADER

### 5.2.1 Contents

The Main Product Header (MPH) identifies the product and its main characteristics. The Main Product Header is an ASCII structure containing information needed for all ENVISAT sensors. It is of fixed length and format for all products. The MPH contains the following major types of information:

#### 5.2.1.1 Product Identification Information

This information includes the file name of the product (which describes most of the essential features of the product, such as instrument, mode, and processing level), the consolidation level of the product, and the document ID number of the documentation describing this product.

#### 5.2.1.2 Information Regarding Data Acquisition and Processing

This information identifies where the product was acquired, where it was processed, when it was processed, and what hardware/software performed the processing.

#### 5.2.1.3 Information on Time of Data

Included in these fields are the UTC start and stop time of data sensing.

#### 5.2.1.4 Information on ENVISAT Orbit and Position

These fields contain orbit positioning data which allow one to determine the exact position of the satellite at the time of sensing.

#### 5.2.1.5 SBT to UTC Conversion Information

This data allows for precise conversion from Satellite Binary Time (as stored in Instrument Source Packets) to the conventional UTC time system.

#### 5.2.1.6 Product Confidence Data

Product Confidence Data in the MPH is designed to very simply provide the user with an assessment of the overall product quality by reporting if errors have occurred during the processing. To obtain a detailed description of the errors which occurred the user refers to the SPH or the detailed PCD structures of the product.

#### 5.2.1.7 Product Size Information

These fields identify the size of various structures within the product so that they may be accurately interpreted.

### 5.2.2 Format

All entries are left justified unless otherwise stated (i.e., any spare characters within

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



an entry are included at the end of the entry). If blank characters are included at the end of a multi-character string, the blanks are written before the closing quotation mark, not after. The fields of the MPH are presented below.

**Table 5.2.2-1 Main Product Header**

Fld.	Contents	Units	Byte length	Data Type
	<i>Product Identification Information</i>			
1	<b>PRODUCT=</b>	keyword	8	8*uc
	quotation mark (“)		1	uc
	<b>Product File name (Note 1)</b> The following fields describe the product naming convention for products. For Auxiliary data files these fields will be different.		62	
	10 character Product ID (including underscoring)	-	10	10*uc
	Processing stage flag (see field 2 below)	-	1	uc
	Originator ID	-	3	3*uc
	start_day (YYYYMMDD UTC of first MDSR, or file creation date for auxiliary files)	-	8	8*uc
	underscore character	-	1	uc
	start_time (HHMMSS UTC of first MDSR, or file creation time for auxiliary files)	-	6	6*uc
	underscore character	-	1	uc
	duration (seconds of product coverage, or 00000000 if not relevant)	sec.	8	8*uc
	phase identifier	-	1	uc
	cycle number within the phase	-	3	3*uc
	underscore character	-	1	uc
	relative orbit # within the cycle (at start of product)	-	5	5*uc
	underscore character	-	1	uc
	absolute orbit # (at start of product)	-	5	5*uc
	underscore character	-	1	uc







## Maintenance and Operations of Earth Observation



<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



Fld.	Contents	Units	Byte length	Data Type
8	<b>SOFTWARE_VER=</b>	keyword	13	13*uc
	quotation mark (“)	-	1	uc
	<b>Software Version number of processing software</b> Format: Name of processor (up to 10 characters)/ version number (4 characters) -- left justified (any blanks added at end). If not used, set to 0000000000000000. e.g. MIPAS/2.310000	-	14	14*uc
	quotation mark (“)	-	1	uc
	newline character	terminator	1	uc
9	<b>Spare (blank characters (Ø))</b>	-	40	40*uc
	newline character	terminator	1	uc
<i>Information on Time of Data</i>				
10	<b>SENSING_START=</b>	keyword	14	14*uc
	quotation mark (“)	-	1	uc
	<b>UTC start time of data sensing (Note 4)</b> (first measurement in first data record) UTC Time format. If not used, set to 00000000000000000000000000000000.	UTC	27	27*uc
	quotation mark (“)	-	1	uc
	newline character	terminator	1	uc
11	<b>SENSING_STOP=</b>	keyword	13	13*uc
	quotation mark (“)	-	1	uc
	<b>UTC stop time of data sensing (Note 4)</b> (last measurements last data record) UTC Time format. If not used, set to 00000000000000000000000000000000.	UTC	27	27*uc
	quotation mark (“)	-	1	uc
	newline character	terminator	1	uc
12	<b>Spare (blank characters (Ø))</b>	-	40	40*uc
	newline character	terminator	1	uc
<i>Information on Envisat Orbit and Position</i>				



## Maintenance and Operations of Earth Observation

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



Fld.	Contents	Units	Byte length	Data Type
13	<b>PHASE=</b>	keyword	6	6*uc
	<b>Phase</b> phase letter. If not used, set to X.	-	1	uc
	newline character	terminator	1	uc
14	<b>CYCLE=</b>	keyword	6	6*uc
	<b>Cycle</b> Cycle number. If not used, set to +000.	-	4	Ac
	newline character	terminator	1	uc
15	<b>REL_ORBIT=</b>	keyword	10	10*uc
	<b>Start relative orbit number (Note 5).</b> If not used, set to +00000	-	6	As
	newline character	terminator	1	uc
16	<b>ABS_ORBIT=</b>	keyword	10	10*uc
	<b>Start absolute orbit number (Note 5).</b> If not used, set to +00000.	-	6	As
	newline character	terminator	1	uc
17	<b>STATE_VECTOR_TIME=</b>	keyword	18	18*uc
	quotation mark (“)	-	1	uc
	<b>UTC of ENVISAT state vector (see Note 6)</b> UTC time format. If not used, set to 00000000000000000000000000000000.	UTC	27	27*uc
	quotation mark (“)	-	1	uc
	newline character	terminator	1	uc
18	<b>DELTA_UT1=</b>	keyword	10	10*uc
	<b>DUT1=UT1-UTC (see Note 6).</b> If not used, set to +.000000.	s	8	Ado06
	<s>	units	3	3*uc
	newline character	terminator	1	uc
19	<b>X_POSITION=</b>	keyword	11	11*uc



## Maintenance and Operations of Earth Observation

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



<b>Fld.</b>	<b>Contents</b>	<b>Units</b>	<b>Byte length</b>	<b>Data Type</b>
	<b>X Position in Earth-Fixed reference (see Note 6).</b> If not used, set to +0000000.000.	m	12	Ado73
	<m>	units	3	3*uc
	newline character	terminator	1	uc
20	<b>Y_POSITION=</b>	keyword	11	11*uc
	<b>Y Position in Earth-Fixed reference (see Note 6).</b> If not used, set to +0000000.000.	m	12	Ado73
	<m>	units	3	3*uc
	newline character	terminator	1	uc
21	<b>Z_POSITION=</b>	keyword	11	11*uc
	<b>Z Position in Earth-Fixed reference (see Note 6).</b> If not used, set to +0000000.000.	m	12	Ado73
	<m>	units	3	3*uc
	newline character	terminator	1	uc
22	<b>X_VELOCITY=</b>	keyword	11	11*uc
	<b>X velocity in Earth fixed reference (see Note 6).</b> If not used, set to +0000.000000.	m/s	12	Ado46
	<m/s>	units	5	5*uc
	newline character	terminator	1	uc
23	<b>Y_VELOCITY=</b>	keyword	11	11*uc
	<b>Y velocity in Earth fixed reference (see Note 6).</b> If not used, set to +0000.000000.	m/s	12	Ado46
	<m/s>	units	5	5*uc
	newline character	terminator	1	uc
24	<b>Z_VELOCITY=</b>	keyword	11	11*uc
	<b>Z velocity in Earth fixed reference (see Note 6).</b> If not used, set to +0000.000000.	m/s	12	Ado46
	<m/s>	units	5	5*uc
	newline character	terminator	1	uc







## Maintenance and Operations of Earth Observation



<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



Fld.	Contents	Units	Byte length	Data Type
	Product Size Information			
36	<b>TOT_SIZE=</b>	keyword	9	9*uc
	<b>Total Size Of Product</b> (# bytes DSR + SPH+ MPH)	bytes	21	Al
	<bytes>	units	7	7*uc
	newline character	terminator	1	uc
37	<b>SPH_SIZE=</b>	keyword	9	9*uc
	<b>Length Of SPH</b> (# bytes in SPH)	bytes	11	Al
	<bytes>	units	7	7*uc
	newline character	terminator	1	uc
38	<b>NUM_DSD=</b>	keyword	8	8*uc
	<b>Number of DSDs</b> This number includes the Spare DSDs and all other types of DSDs.	-	11	Al
	newline character	terminator	1	uc
39	<b>DSD_SIZE=</b>	keyword	9	9*uc
	<b>Length of Each DSD</b> (# bytes for each DSD, all DSDs shall have the same length)	-	11	Al
	<bytes>	units	7	7*uc
	newline character	terminator	1	uc
40	<b>NUM_DATA_SETS=</b>	keyword	14	14*uc
	<b>Number of DSs attached</b> (not all DSDs have a DS attached)	-	11	Al
	newline character	terminator	1	uc
41	<b>Spare (blank characters (Ø))</b>	-	40	40*uc
	newline character	terminator	1	uc
<b>TOTAL</b>		-	<b>1247</b>	

- a. If a leap error occurs in the product, the product is not in true UTC time (no leap correction is applied).





## Maintenance and Operations of Earth Observation

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



### MPH Notes:

1. The product identifier is a unique string which may be used as a file name when storing a product. The format is presented in detail in the section on product identification scheme in Annex A. The duration of a product is frequently not an integer number of seconds. When it is not, the duration field of the product file name shall be reported as the nearest whole integer (e.g. 4.6 seconds duration is reported as 0000005 in the product file name. For Auxiliary Data files, the filename will follow the format described in Volume 16.
2. The reference document describing the product must be updated with any change in the processor software. If the reference document is the Products Specifications PO-RS-MDA-GS-2009, the version and the revision have to refer to the Volume 1 of the document, where the status (version and revision) of all volumes of the document can be found.
3. Since a product can be generated in a different center than the receiving station, it is necessary to have this field to identify the Production Center ID.
4. This is the start time and stop time in UTC format when the data sensing occurred on board the satellite, as calculated from the Satellite Binary Time counter for the first and last MDSR in the Level 0 product.
5. The satellite orbit number is specified in two ways: absolute number and relative to a specific orbit cycle. The orbit numbers given are those current at the Sensing Start Time of the product .
6. The Orbit State Vector (OSV) corresponds to the Ascending Node crossing of the orbit that includes the sensing start of the product to be processed (either L0 or L1, to generate the higher level product L1 or L2), when the OSV is generated from the DORIS Navigator Level 0 product (DOR\_NAV\_OP), or from the FOS Predicted Orbit (AUX\_FPO\_AX). The OSV is the closest after the start time of the product to be processed (either L0 or L1, to generate the higher level product L1 or L2), when the OSV is generated from the DORIS preliminary product (DOR\_POR\_2P), DORIS precision product (DOR\_VOR\_2P), or from the FOS Restituted Orbit (AUX\_FRO\_AX).
7. The processing segment is defined by the segment start and stop times. In stripline processing, the strips processed represent a subset of the segment data. As a result, the product coming from a strip may have the LEAP\_ERR set to 1 with the LEAP\_UTC after SENSING\_STOP or before SENSING\_START.

An example of an MPH is shown in Figure 5.2.2-1 (values used are for



## Maintenance and Operations of Earth Observation

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



---

illustrative purposes only and may not correspond exactly to the proper product values).



## Maintenance and Operations of Earth Observation



Title:	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
Contract Ref.:	ESA/Esrin 19049/05/I-OL		
Document Ref.:	PO-RS-MDA-GS-2009	Issue: 3	Rev.: D
Consortium Ref.:	OSME-DPQC-SEDA-RS-07-0544	Date:	22/11/2007



```
PRODUCT="MIP_NL__OPVD-P19990210_133254_00006040A031_00067_15598_0324.N1"
PROC_STAGE=V
REF_DOC="PO-TN-ESA-GS-0000_3/B "
```

```
ACQUISITION_STATION="PHDS-K, DPAC, LRAC "
PROC_CENTER="DPAC "
PROC_TIME="11-JAN-2000 09:56:14.000000"
SOFTWARE_VER="MIPAS/1.21 "
```

```
SENSING_START="10-FEB-1999 13:32:54.000000"
SENSING_STOP="10-FEB-1999 15:12:54.000100"
```

```
PHASE=A
CYCLE=+031
REL_ORBIT=+00067
ABS_ORBIT=+15598
STATE_VECTOR_TIME="10-FEB-1999 13:32:54.000000"
DELTA_UT1=+.123456<s>
X_POSITION =+0082343.324<m>
Y_POSITION =+0000340.223<m>
Z_POSITION =+0034345.664<m>
X_VELOCITY =+0045.433223<m/s>
Y_VELOCITY=+0345.056564<m/s>
Z_VELOCITY=+0000.003432<m/s>
VECTOR_SOURCE="DP"
```

```
UTC_SBT_TIME="10-FEB-1999 13:32:54.000000"
SAT_BINARY_TIME=+1643678245
CLOCK_STEP=+1345466557<ps>
```

```
LEAP.UTC=""
LEAP_SIGN=+000
LEAP_ERR=0
```

```
PRODUCT_ERR=0
TOT_SIZE=+0000000000083426100<bytes>
SPH_SIZE=+0000001200<bytes>
NUM_DSDDS=+0000000005
DSD_SIZE=+0000000280<bytes>
NUM_DATA_SETS=+0000000003
```

Figure 5.2.2-1 Example MPH



## Maintenance and Operations of Earth Observation



<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



### 5.3 SPECIFIC PRODUCT HEADER

#### 5.3.1 Contents

The Specific Product Header is included with every product. It contains information specific to the product itself. This information may include PCD information applying to the whole product, and/or relevant processing parameters. At a minimum, each SPH will include an SPH descriptor, and at least one DSD.

#### 5.3.2 Format

The SPH will follow an ASCII keyword-value<units>-terminator format identical to that of the MPH. The detailed SPH structure and contents are given in the sections where each specific product is described.

### 5.4 DATA SET DESCRIPTORS

The Data Set Descriptor (DSD) are used to describe an attached Data Set or to provide references to external files relevant to the current product (e.g., auxiliary data used in processing but not included with the product). There must be one DSD per Data Set or per reference to an external file. The DS may be a Measurement Data Set (MDS), an Annotation Data Set (ADS) or a Global Annotation Data Set (GADS).

#### 5.4.1 Contents

All DSDs have the same format. The Data Set Descriptor is contained within the SPH as shown in Figure 5.1-2. As such, the DSD is also in ASCII format. The DSD contains information specific to a given Data Set within the product. The general contents of a DSD are shown in Table 5.4.2-1.

#### 5.4.2 Format

The structure of the DSDs will be the same for all products and all instruments. The ASCII format conventions are the same as those used for the MPH and SPH. This structure is referred to as “dsd” throughout this document. The general format is shown in Table 5.4.2-1.

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



**table 5.4.2-1 General DSD Format**

Field #	Description	Units	Byte length	Data Type
1	<b>DS_NAME=</b>	keyword	8	8*uc
	quotation mark (“)	-	1	uc
	<b>Data Set Name</b> Name describing the data set. Characters not used are blanked.	-	28	28*uc
	quotation mark (“)	-	1	uc
	newline character	terminator	1	uc
2	<b>DS_TYPE=<sup>a</sup></b>	keyword	8	8*uc
	<b>DS Type</b> = M if a Measurement DS is attached. = A if an Annotation DS is attached = G if a Global ADS is attached = R if no DS is attached (reference DSD only)	-	1	uc
	newline character	terminator	1	uc
3	<b>FILENAME=</b>	keyword	9	9*uc
	quotation mark (“)	-	1	uc
	<b>External Product Reference</b> If the DS Attachment flag was set to R this field contains the name of the referenced product using the standard naming convention (as defined in ANNEX A or Volume 16 for auxiliary data) of the MPH. If the DS Attachment Flag was set to A, M, or G, this field may contain the name of the file from which the Data Set was copied, or it may be blank (set to ascii blank space characters). For a product which was supposed to contain a data set or reference to one, but the file was unavailable, the first 7 characters of this field may be set to MISSING and the rest blanked. If space for a DSD has been set aside in the SPH, but the DSD is not used in the current product, this field may be set to NOT USED.	-	62	62*uc
	quotation mark (“)	-	1	uc
	newline character	terminator	1	uc
4	<b>DS_OFFSET=</b>	keyword	10	10*uc
	<b>DS Offset in bytes</b> Gives the position of the first byte of the corresponding DS with respect to the whole product. Set to 0 if no DS is attached.	bytes	21	Ad
	<b>&lt;bytes&gt;</b>	units	7	7*uc

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



Field #	Description	Units	Byte length	Data Type
	newline character	terminator	1	uc
5	<b>DS_SIZE=</b>	keyword	8	8*uc
	<b>Total Size of DS in bytes</b> Length in bytes of the Data Set. Set to zero if no DS is attached.	bytes	21	Ad
	<b>&lt;bytes&gt;</b>	units	7	7*uc
	newline character	terminator	1	uc
6	<b>NUM_DSR=</b>	keyword	8	8*uc
	<b>Number of DSRs within the DS</b> Number of Data Set Records within the DS, set to zero if no DS is attached.	-	11	Al
	newline character	terminator	1	uc
7	<b>DSR_SIZE=</b>	keyword	9	9*uc
	<b>Length of the DSRs in bytes</b> Length of each DSR if DSR length is constant within the Data Set. 0 = no DSRs attached (i.e. no DS attached) -1 = DSR length is variable.	bytes	11	Al
	<b>&lt;bytes&gt;</b>	units	7	7*uc
	newline character	terminator	1	uc
8	<b>Spare (blanks)</b>	ascii	32	32*uc
	newline character	terminator	1	uc
	<b>TOTAL</b>		280	

a. The “DSD Type” flag has been combined with the “DSD Attachment” flag by allowing more possible letters.

### 5.4.3 Example DSDs

All DSDs must be the same size. In order to clarify the use of DSDs within the product structure, the 5 possible DSD contents are shown explicitly below. All DSDs should fall into one of the following categories. Note that the symbol Ø is used to denote the ASCII blank space character (ASCII character 32). Values given in the following examples are for illustrative purposes only and may not correspond to the true values.









## Maintenance and Operations of Earth Observation

<b>Title:</b>	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
<b>Contract Ref.:</b>	ESA/Esrin 19049/05/I-OL		
<b>Document Ref.:</b>	PO-RS-MDA-GS-2009	<b>Issue:</b> 3	<b>Rev.:</b> D
<b>Consortium Ref.:</b>	OSME-DPQC-SEDA-RS-07-0544	<b>Date:</b>	22/11/2007



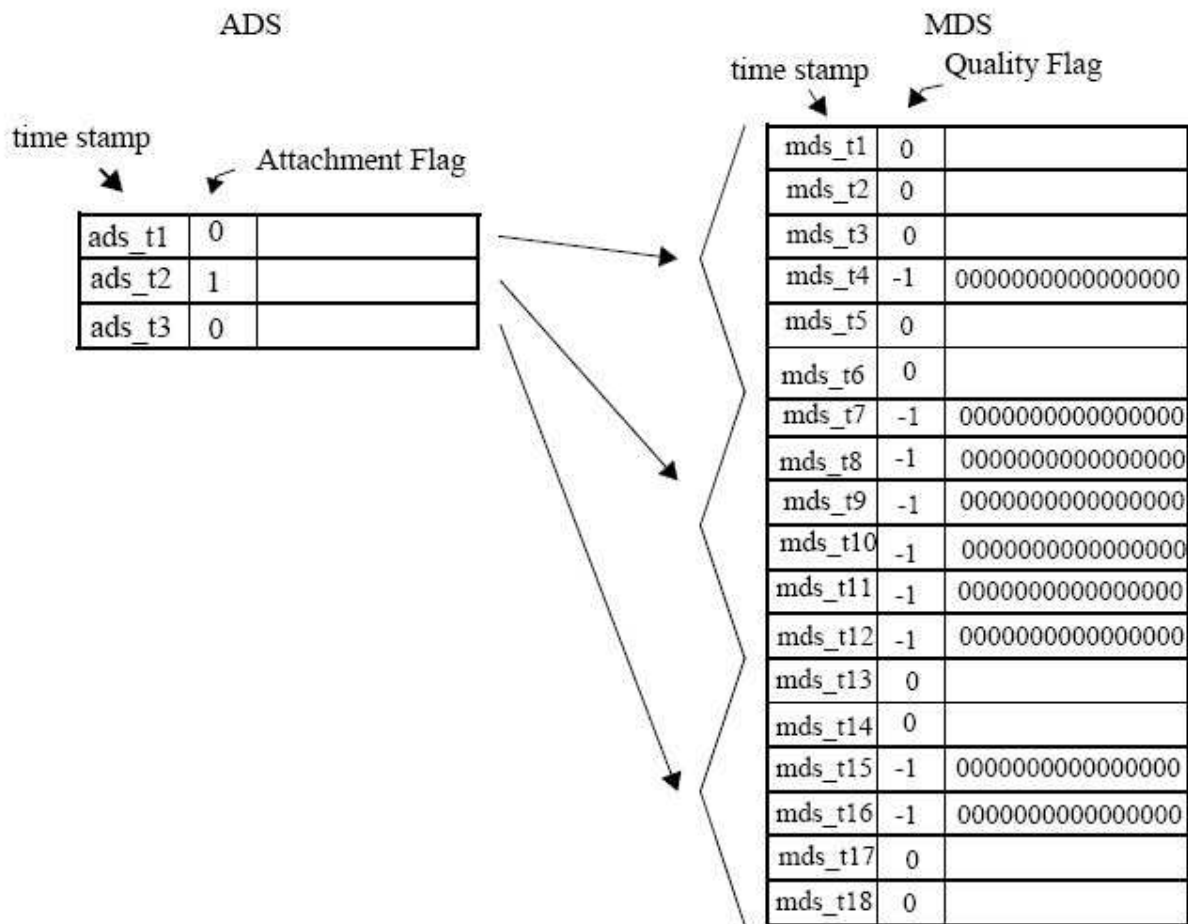
MDSR quality. A value of -1 indicates the MDSR is a blank MDSR (used for Level 1B and Level 2 only);

- Attachment Flag: for ADSRs, a signed character flag may be included to indicate if corresponding MDSRs exist for the ADSR (1 = error, no corresponding MDSRs, 0 = no error). This flag is used to identify large gaps in the sequence of MDSRs.<sup>2</sup> In LADSRs, this flag identifies empty granules. An example is provided in Figure 5.5.2-1. If an ADS corresponds to more than 1 MDS, the attachment flag is evaluated for each MDS in turn, then combined into 1 flag via a logical OR operation.
- for GADS, no time stamp or flag is required.
- the data itself.

For Level 0 data, the MDSRs contain Annotated Instrument Source Packets (AISPs) preceded by a time stamp (sensing time) in MJD 2000 format.

<sup>2</sup> To simplify processing, this flag is only used for geolocation ADSs (LADSs), and Summary Quality ADSs (SQADSs). In all other cases, it is always set to zero.

Title:	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
Contract Ref.:	ESA/Esrin 19049/05/I-OL		
Document Ref.:	PO-RS-MDA-GS-2009	Issue: 3	Rev.: D
Consortium Ref.:	OSME-DPQC-SEDA-RS-07-0544	Date:	22/11/2007



**Figure 5.5.2-1 Example of Attachment Flag Usage**

In this example, the ADSR with time stamp ads\_t2 is valid for the MDSRs from mds\_t7 to mds\_t12. However, all these MDSRs have been zero filled due to missing data, as indicated by the fact that their Quality Flags are set to -1. Therefore the Attachment Flag for ads\_t2 is set to 1. The Attachment Flag for the ADSRs with time stamps ads\_t1 and ads\_t3 are not set to 1 since only part of the data is missing. In this way, the Attachment Flag can be used to identify large gaps of missing measurement data.



## Maintenance and Operations of Earth Observation

Title:	ENVISAT-1 PRODUCTS SPECIFICATIONS VOLUME 05: PRODUCT STRUCTURES		
Contract Ref.:	ESA/Esrin 19049/05/I-OL		
Document Ref.:	PO-RS-MDA-GS-2009	Issue: 3	Rev.: D
Consortium Ref.:	OSME-DPQC-SEDA-RS-07-0544	Date:	22/11/2007



### DISTRIBUTION LIST

NAME	COPY	NAME	COPY