ERS-1.WSC.DWP PRODUCT

CCT FORMAT

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Dealiased wind field and pressure field

Acronym: **WSC.DWP**

This product contains the wind field reconstructed from the sigma nought data measured by the ERS-1 scatterometer on a grid of 19x19 nodes covering an area of 500 km^2 and the surface pressure field generated from the computed wind field on the same grid of measure.

The wind field is referred at a height of 10m above the sea level.

The measurements of the sigma nought values are obtained by three antennas pointing in different directions: the mid beam antenna, which illuminates the sea surface in the across satellite track direction and the for and aft beam antennas which look respectively at an angle of 45° degrees before and after the mid beam. Hence for each point on the sea surface three echo power values obtained from three different angles are used to reconstruct the surface wind vectors (wind speed and direction).
However the grid points on the sea surface may have only two or one sigma nought measurements (incomplete data); this is caused by the blinding of one antenna and by the switching on/off of the scatterometer.

The procedure used to generate the wind field contained in this product is applicable to nodes provided with at least two sigma nought measurements but only if at least one node with three sigma nought measurements is available.
The capability to process nodes with incomplete data is very important in the Mediterranean area where the occurrence of such a kind of data is very high.

The wind field reconstruction algorithm consists of a three-step procedure:
- illuminated area subdivision;
- wind extraction;
- wind field dealiasing.

In the first step, the area of 500 km^2 that must be processed is divided in Ns sub-areas where a particular node is chosen for the global minimization algorithm to be performed.
In the second step, two different wind vectors are computed for each node of the grid with at least two measurements.
In the third step the ranking of the two candidate solutions is performed so that for each node a rank1 and a rank2 solution is given. According to criteria based on the estimates of the two ranked solutions the ambiguity removal is performed in autonomus mode without using a priori information on the wind field, or in meteorological mode by comparing the two ranked wind fields with an analyzed wind field supplied by meteorological centres.

Besides, together with the wind field the product will contain the surface pressure field computed using the Navier-Stokes equations relating the wind vector field to the pressure field.
The generation of the pressure field is related to some criteria evaluating the percentage of valid nodes that is sea nodes provided with a valid computed wind vector.

The surface pressure field reconstruction procedure consists of the following main steps:
- computation of the pressure gradient approximation from the dealiased wind vector field;
- projection of the pressure gradient into the curl free space (because of the curl free nature of a gradient field);
- extraction of the surface pressure field from the projected pressure gradient field.

1) General CCT structure

The CCT contains the following four files:

Volume Directory File
Leader File
Data Set File
Null Volume File

2) Files description

a) Volume Directory File:

Volume Descriptor Record	360 bytes (mandatory)
Leader File Pointer Record	360 bytes (mandatory)
Data Set File Pointer Record	360 bytes (mandatory)

b) Leader File:

File Descriptor Record	360 bytes (mandatory)
DWP Catalogue Record(s)	1660 bytes (mandatory)

c) Data Set File:

File Descriptor Record	360 bytes (mandatory)
Data Record	8570 bytes (mandatory)
It includes:	one Record Header (20 bytes)
	one Main Product Header (102 bytes)
	one Specific Product Header (144 bytes)
	361 Product Data Set Records (23 bytes)
	spare (1 byte)

d) Null Volume File:

Volume Descriptor Record	360 bytes (mandatory)

Table 2.1 VOLUME DESCRIPTOR RECORD

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	record sequence number	(1)
2	5	B1	1-st record subtype code	(192)
3	6	B1	record type code	(192)
4	7	B1	2-nd record subtype code	(18)
5	8	B1	3-rd record subtype code	(18)
6	9-12	B4	length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag	A$
8	15-16	A2	blanks	$$
9	17-28	A12	format control document	CCB-LBR-0001
10	29-30	A2	superstructure format control document	A$
11	31-32	A2	superstructure record format revision	A$
12	33-44	A12	logical volume gene ating facility software release and revision level	<software.id>
13	45-60	A16	ID of physical volume contatining this volume descriptor	<physical.tape.id>
14	61-76	A16	logical volume identifier	<logical.set.id>
15	77-92	A16	volume set identifier (product generation date) (YYYYMMMDDhhmmssdd, dd=deci-secs)	<volume.set.id>
16	93-94	I2	total number of physical volumes in the logical volume	$1
17	95-96	I2	physical volume sequence number of the first tape within the logical volume	$1
18	97-98	I2	physical volume sequence number of the larst tape within the logical volume	$1
19	99-100	I2	physical volume sequence number of the current tape within the logical volume	$1
20	101-104	I4	first referenced file number in this physical volume within the logical volume	$$$1
21	105-108	I4	logical volume within a volume set	$$$1
22	109-112	I4	logical volume number within physical volume	$$$1
23	113-120	A8	logical volume creation date (YYYYMMDD)	<YYYYMMDD>
24	121-128	A8	logical volume creation time (hhmmssdd, dd=deci-seconds)	<hhmmssdd>
25	129-140	A12	logical volume generating country	<country..>
26	141-148	A8	logical volume generating agency	<agency..>
27	149-160	A12	logical volume generating facility	<facility..>
28	161-164	I4	number of file pointer records in volume directory	$$$2
29	165-168	I4	number of records in volume directory	$$$3
30	169-260	A92	volume descriptor spare segment (always blank filled)	(blanks)
31	261-360	A100	local use segment	(blanks)

Table 2.2 LEADER FILE POINTER RECORD

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	record sequence number	(2)
2	5	B1	1-st record subtype code	(219)
3	6	B1	record type code	(192)
4	7	B1	2-nd record subtype code	(18)
5	8	B1	3-rd record subtype code	(18)
6	9-12	B4	length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag	A$
8	15-16	A2	blanks	$$
9	17-20	I4	referenced file number	$$$1
10	21-36	A16	referenced file name	ERS1.WSC.DWPLEAD
11	37-64	A28	referenced file class	WSCLEADER$FILE
12	65-68	A4	referenced file class code	WSCL
13	69-96	A28	referenced file data type	MIXED$BINARY$AND$ASC
14	97-100	A4	referenced file data type code	MBAA
15	101-108	I8	number of records in referenced file	<nnnnnnnn>
16	109-116	I8	referenced file 1-st record length	$$$$$512
17	117-124	I8	referenced file maximum record length	$$$$1660
18	125-136	A12	referenced file record length type	VARIABLE$LEN
19	137-140	A4	referenced file record length type code	VARE
20	141-142	I2	referenced file physical volume start number	$1
21	143-144	I2	referenced file physical volume end number	$1
22	145-152	I8	referenced file	$$$$$$$1
23	153-160	I8	referenced file	<nnnnnnnn>
24	161-260	A100		(blanks)
25	261-360	A100		(blanks)

Table 2.3 DATA FILE POINTER RECORD

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	record sequence number	(3)
2	5	B1	1-st record subtype code	(219)
3	6	B1	record type code	(192)
4	7	B1	2-nd record subtype code	(18)
5	8	B1	3-rd record subtype code	(18)
6	9-12	B4	length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag	A$
8	15-16	A2	blanks	$$
9	17-20	I4	referenced file number	$$$2
10	21-36	A16	referenced file name	ERS1.WSC.DWPTOP
11	37-64	A28	referenced file class	DATA$TYPE$OPTIONS$FILE
12	65-68	A4	referenced file class code	DTOP
13	69-96	A28	referenced file data type	MIXED$BINARY$AND$ASC
14	97-100	A4	referenced file data type code	MBAA
15	101-108	I8	number of records in referenced file	<nnnnnnnn>
16	109-116	I8	referenced file 1-st record length	$$$$$512
17	117-124	I8	referenced file maximum record length	$$$$8570
18	125-136	A12	referenced file record length type	VARIA$LENGTH
19	137-140	A4	referenced file record length type code	VARI
20	141-142	I2	referenced file physical volume start number	$1
21	143-144	I2	referenced file physical volume end number	$1
22	145-152	I8	referenced file	<$$$$$$$1>
23	153-160	I8	referenced file	<nnnnnnnn>
24	161-260	A100		(blanks)
25	261-360	A100		(blanks)

Table 3.1 WSCLEADER FILE - FILE DESCRIPTOR RECORD (FIXED SEGMENT) DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	record sequence number	(1)
2	5	B1	1-st record sub-type code	(63)
3	6	B1	record type code	(192)
4	7	B1	2-nd record sub-type code	(18)
5	8	B1	3-rd record sub-type code	(18)
6	9-12	B4	length of this record	(512)
7	13-14	A2	ASCII/EBCDIC flag	$A
8	15-16	A2	blanks	$$
9	17-28	A12	format control document ID for this data file format	CEOS-LBR-CCT
10	29-30	A2	format control document revision level	$A
11	31-32	A2	file design descriptor revision letter	$A
12	33-44	A12	generating software release and revision level	<software.id>
13	45-48	I4	file number	$$$1
14	49-64	A16	file name	ERS1.WSC.DWPLEAD
15	65-68	A4	record sequence and location type flag	FSEQ
16	69-76	I8	sequence number location	$$$$$$$1
17	77-80	I4	sequence number field length	$$$4
18	81-84	A4	record code and location type flag	FTYP
19	85-92	I8	record code location	$$$$$$$5
20	93-96	I4	record code field length	$$$4
21	97-100	A4	record length and location type flag	FLGT
22	101-108	I8	record length location	$$$$$$$9
23	109-112	I4	record length field length	$$$4
24	113	A1	reserved	blank
25	114	A1	reserved	blank
26	115	A1	reserved	blank
27	116	A1	reserved	blank
28	117-180	A64	reserved segment	blank

Table 3.2

WSCLEADER FILE - FILE DESCRIPTOR RECORD (VARIABLE SEGMENT) DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
29	181-186	I6	number of catalogue records	<nnnnnn>
30	187-192	I6	length of above records	$$1660
31	193-198	I6	reserved	
32	199-204	I6	reserved	
33	205-210	I6	number of platform pos. data records	$$$$$0
34	211-216	I6	length of above records	$$$$$0
35	217-222	I6	number of attitude data records	$$$$$0
36	223-228	I6	length of above records	$$$$$0
37	229-234	I6	reserved	
38	235-240	I6	reserved	
39	241-246	I6	number of OBOG time correlation records	$$$$$0
40	247-252	I6	length of above records	$$$$$0
41	253-258	I6	reserved	
42	259-264	I6	reserved	
43	265-270	I6	number of sensor parameters data records	$$$$$0
44	271-276	I6	length of above records	$$$$$0
45	277-282	I6	number of calibration data records	$$$$$0
46	283-288	I6	length of above records	
47	289-294	I6	spare	
48	295-300	I6	spare	$$$$$0
49	301-306	I6	spare	
50	307-312	I6	spare	
51	313-318	I6	spare	
52	319-324	I6	spare	
53	325-330	I6	spare	
54	331-336	I6	spare	
55	337-342	I6	spare	
56	343-348	I6	spare	
57	349-354	I6	number of facility data records	$$$$$0
58	355-360	I6	spare	$$$$$0
59	361-366	I6	spare	
60	367-372	I6	spare	
61	373-378	I6	spare	
62	379-384	I6	spare	
63	385-390	I6	spare	
64	391-396	I6	spare	
65	397-402	I6	spare	
66	403-408	I6	spare	
67	409-414	I6	spare	
68	415-420	I6	spare	
69	421-426	I6	spare	
70	427-432	I6	spare	
71	433-512	A80	blanks	

Table 3.3 CATALOGUE RECORD DEFINITION

Each record is composed of 10 sub-records, each one being able to contain the information relatives to one product. When a sub-record is empty, which is only possible in the last record, it is filled with blanks.

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	sequence number	(2,..,n)
2	5	B	1-st subtype	(10)
3	6	B	type code	(30)
4	7	B	2-nd subtype	(33)
5	8	B	3-rd subtype	(50)
6	9-12	B4	record length	(1660)
7	13-16	I4	second sequence number incremented at each record, updated to 1 every time the record type changes	
8	17-20	I4	number of catalogue data per record = 10 maxi	
		.....	.....	
9	21-30	F10.4	dataset ident	
10	31	I1	raw data quality indicator from 0 (best quality) to 9 (worst quality)	
11	32-37	F6.2	SW latitude in degrees. A negative value denotes south latitude and a positive value, north latitude.	
12	38-43	F6.2	SW longitude in degrees (ie: 0.00-360.00 from Greenwich to East)	
13	44-49	F6.2	SE latitude	
14	50-55	F6.2	SE longitude	
15	56-61	F6.2	NW latitude	
16	62-67	F6.2	NW longitude	
17	68-73	F6.2	NE latitude	
18	74-79	F6.2	Ne longitude	
19	80-82	A3	orbital cycle number	
20	83	A1	orbital sense A = Ascending D = Descending	
21	84-87	I4	orbit number in the cycle varying from 1 to 43 for the 3 days repeat cycle	
22	88-92	I5	revolution number	
23	93-112	A20	start date (DD/MON/YYYY - HH:MI:SS)	

Table 3.3 CATALOGUE RECORD DEFINITION (cont' ed)

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
24	113-114	A2	station identifier GS = Gatineau Station KS = Kiruna Station MS = Mas Palomas Station Fs = Fucino Station	
25	115-131	A17	station product identifier corresponds to the product id present in the main product header	
26	132-133	I2	number of lines in the product	
27	134-136	I3	number of invalid points	
28	137-139	I3	number of points with 3 antennas	
29	140-142	I3	number of points with 2 antennas	
30	143-145	I3	number of points over land	
31	146-165	A20	processing date (DD/MON/YYYY - HH:MI:SS)	
32	166-169	F4.1	software version number	
33	170	I1	quality indicator from 0 (best quality) to 9 (worst quality)	
34	171	A1	ambiguity removal 0 = ambiguity removed autonomously 1 = use of meteorological table after autonomous ambiguity removal 2 = ambiguity removed by meteorological data only	
35	172-176	F5.2	maximum wind speed (M/S)	
36	177-181	F5.2	average wind speed (M/S)	
37	182-184	I3	average wind direction (degrees)	
		.....	.....2nd sub-record.....	
38	185-xxx			

Table 4.1 DATA TYPE OPTION FILE - FILE DESCRIPTOR RECORD (FIXED SEGMENT) DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	record sequence number	(1)
2	5	B1	1-st record sub-type code	(63)
3	6	B1	record type code	(192)
4	7	B1	2-nd record sub-type code	(18)
5	8	B1	3-rd record sub-type code	(18)
6	9-12	B4	length of this record	(8570)
7	13-14	A2	ASCII/EBCDIC flag	$A
8	15-16	A2	blanks	$$
9	17-28	A12	format control document ID for this data file format	CEOS-LBR-CCT
10	29-30	A2	format control document revision level	$A
11	31-32	A2	file design descriptor revision letter	$A
12	33-44	A12	generating software release and revision level	<software.id>
13	45-48	I4	file number	$$$1
14	49-64	A16	file name	ERS1.WSC.DWPLEAD
15	65-68	A4	record sequence and location type flag	FSEQ
16	69-76	I8	sequence number location	$$$$$$$1
17	77-80	I4	sequence number field length	$$$4
18	81-84	A4	record code and location type flag	FTYP
19	85-92	I8	record code location	$$$$$$$5
20	93-96	I4	record code field length	$$$4
21	97-100	A4	record length and location type flag	FLGT
22	101-108	I8	record length location	$$$$$$$9
23	109-112	I4	record length field length	$$$4
24	113	A1	reserved	blank
25	114	A1	reserved	blank
26	115	A1	reserved	blank
27	116	A1	reserved	blank
28	117-180	A64	reserved segment	blank

Table 4.2

DATA TYPE OPTION FILE - FILE DESCRIPTOR RECORD (VARIABLE SEGMENT) DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
29	181-186	I6	number of DATA records in the DATA FILE	
30	187-192	I6	length of the above records	
31	193-216	A24	spare	
32	217-220	I4	number of records in a product	
33	221-228	I8	length of a product	
34	229-236	A8	spare	
35	237-240	I4	number of lines in a product	
36	241-244	I4	number of measures per line	
37	245-248	I4	spare	
38	249-254	I6	length of a line	
39	255-260	I6	length of a measure	
40	261-268	I8	spare	
41	269-272	A4	interleaving indicator	
42	273-276	I4	length of main product header	
43	277-280	I4	length of secondary product header	
44	281-288	I8	spare	
45	289-292	I4	$$$0	
46	293-296	I4	$$$0	
47	297-360	A64	spare	

Each DATA FILE record has the same structure. This structure consists of the following parts:

Header Record (20 bytes)
Main Product Header (102 bytes)
Specific Product Header (144 bytes)
361 Data Set Records (23 bytes)
Spare (1 byte)

Table 4.3 WSC.DWP DATA OPTION FILE RECORD DEFINITION

Header Record

FIELD	BYTES	FORMAT	DESCRIPTION	UNITS
1	1-4	B4	record sequence number	(n)
2	5	B1	1-st record sub-type code	70
3	6	B1	record type code	30
4	7	B1	2-nd record sub-type code	33
5	8	B1	3-rd record sub-type code	50
6	9-12	B4	length of this record	8570
7	13-16	A4	blanks	
8	17-20	A4	blanks	

Main Product Header

FIELD	BYTES	FORMAT	DESCRIPTION	UNITS
1	1-4	I4	product label	n.a.
2	5	I1	type of product	n.a.
3	6	I1	satellite	n.a.
4	7	I1	ascending or descending pass	n.a.
5	8-31	A	UTC time of sub satellite point at beginning of product. Format in ASCII: "dd-mmm-yyyy hh:mm:ss.ttt" For example: "23-SEP-1987 12:30:27.123"	n.a.
6	32	I1	station were data were processed	n.a.
7	33-56	A	UTC time when MPH was generated. Format as in field 5.	n.a.
8	57-58	A	Software version	n.a.
9	59-62	I4	size of specific product header record in bytes	n.a.
10	63-66	I4	number of product data set records	n.a.
11	67-70	I4	syze of each product data set record in bytes	n.a.
12	71-94	A	UTC reference time. Time relation used in on board to ground time conversion with the next two fields	n.a.
13	95-98	I4	on board binary time	n.a.
14	99-102	I4	on board clock interval	n.a.

Specific Product Header

FIELD	BYTES	FORMAT	DESCRIPTION	UNITS
1	2	I2	**Product confidence data** bit 1 Processing division techniques 0=no use of division 1=use of division bit 2 Input data filter before processing 0=no filter 1=data filter bit 3 Weight factors use 0=no use of weight factors 1=use of weight factors for the minimization bit 4 Blank product flag 0=no input data available 1=data available bit 5 Incomplete data flag 0=all complete data (three sigma nought values) 1=presence of incomplete data (two or one sigma nought values) bit 6 EDA FD flag 0=no use of ESA Fast Delivery wind field 1=use of ESA FD wind field as a priori information bit 7 Meteo flag 0=no use of met. wind field 1=use of meteorological wind field bit 8 Autonomous ambiguity removal flag * 0=no success with auton. ambiguity removal 1=success with auton. ambiguity removal bit 9 Pressure flag * 0=no pressure field generation 1=pressure field generation bit 10 Geostrophic approximation flag 0=geostr. approx. not applied 1=geostr. approx. applied bit 11 Windowing flag 0=no use of windowing technique for pressure generation 1=use of windowing technique for pressure generation bit 12 Pressure gradient interpolation flag 0=no pressure gradient interpolation 1=pressure gradient interpolation bit 13 Curl free projection flag 0=no curl free projection 1=curl free projection bit 14,15,16 Spare	n.a.
2	3-4	I2	number of points with three sigma nought values	n.a.
3	5-6	I2	number of points with two sigma nought values	n.a.

Specific Product Header (cont 'ed)

FIELD	BYTES	FORMAT	DESCRIPTION	UNITS
4	7-8	I2	number of points with one sigma nought value	n.a.
5	9-10	I2	number of invalid points	n.a.
6	11-12	I2	number of land points	n.a.
7	13-14	I2	number of points with Kp out of range *	n.a.
8	15-16	I2	number of points with wind speed out of range *	n.a.
9	17-18	I2	number of processed points	n.a.
10	19-20	I2	number of rank1 points	n.a.
11	21-22	I2	number of rank2 points	n.a.
12	23-24	I2	number of subdivisions (Ns) *	n.a.
13	25-26	I2	percentage of points with two sigma nought values	0.1%
14	27-28	I2	percentage of points with one sigma nought value	0.1%
15	29-30	I2	percentage of invalid points	0.1%
16	31-32	I2	percentage of land points	0.1%
17	33-34	I2	percentage of rank1 points	0.1%
18	35-36	I2	percentage of rank2 points	0.1%
19	37-40	I4	geographical latitude of product centre negative value: south latitude positive value: north latitude	1.E-4 deg
20	41-44	I4	geographical longitude of product centre (0-360 from Greenwich to East)	1.E-4 deg
21	45-46	I2	rank1 average wind speed	cm/s
22	47-48	I2	rank1 associated wind direction	deg
23	49-50	I2	rank2 average wind speed	cm/s
24	51-52	I2	rank2 associated wind direction	deg
25	53-54	I2	rank1 wind speed standard deviation	cm/s
26	55-56	I2	rank2 wind speed standard deviation	cm/s
27	57-58	I2	column number identifier of zero pressure reference node *	n.a
28	59-60	I2	row number identifier of zero pressure reference node *	n.a.
29			data per global minimization node (see below) *	

For each point in which the global minimization is performed:
(Maximum number Ns= 6 points)

FIELD	BYTES	FORMAT	DESCRIPTION	UNITS
1	1-2	I2	sequence number identifier	n.a.
2	3-6	I4	geographical latitude	1.E-4 deg
3	7-10	I4	geographical longitude	1.E-4 deg
4	11-12	I2	wind speed value	cm/s
5	13-14	I2	wind direction value	deg

* Fields description :

Field 1 (Product confidence data)

bit 8	:	Success with autonomous ambiguity removal is obtained if the percentage of rank1 nodes is greater than 70 %.
bit 9	:	The pressure field is generated if the percentage of processed nodes is greater than 50%.
Field 7	:	The Kp value is out of range if it is greater than 20%.
Field 8	:	The wind speed value is out of range if it is less than 4 m/s or greater than 24 m/s.
Field 12	:	The number of subdivisions ranges from 1 to 6. A number of subdivisions greater than 1 (Ns=1 : no subdivision) means that the global minimization algorithm used for the data processing is performed a number of times equal to Ns (**).
Field 27,28	:	The pressure field values are given with respect to a reference node with zero pressure.
Field 29	:	Data relative to each node in which the global minimization is performed (see field 26).

(**) The wind field reconstruction procedure is based on the minimization of the following function:

$$f(w,\phi) = \sum_{k\in\{A\}} p^k [\sigma_0^k - \sigma_0(w, \phi + a^k)]^2$$

where:

{A} : set of antennas giving valid data at the node

w = wind speed at the node

ϕ = upwind direction at the node w.r.t. mid beam direction

α^k = aspect angle of the k-th antenna

p^k = weight assigned to the k-th antenna

σ_0^k = backscattering coefficient measured by the k-th antenna

$\sigma_0(w,\phi)$ = C-band model used for the wind field reconstruction

It is essentially based on a suitable use of two minimization algorithms: a global (GM) and a local (LM) minimization algorithm. A first run of LM algorithm for each grid node is made in order to select the nodes over which running the GM algorithm; the global minimizer is then used as first guess for a second run of the LM algorithm. In this way a first candidate wind field (rank1 wind field) is extracted all over the grid nodes and a second candidate wind field (rank2) is extracted by another run of the (LM) algorithm using as first guess the rank1 wind field pointing in the opposite direction. Finally the ranking of the two candidate wind fields is made and the "ambiguous" wind field is removed. Processing with subdivision techniques means that the reconstruction procedure is repeated for each sub-area (the maximum number of subareas is Ns=6) and that the GM algorithm is runned Ns times. The data of the nodes where the global minimization is performed are contained in field 29.

Data Set Record

FIELD	BYTES	FORMAT	DESCRIPTION	UNITS
1	1	I1	column number identifier	n.a.
2	2	I1	row number identifier	n.a.
3	3-4	B2	**Measurement confidence data** bit 1 Measurement validity 0=no valid measurement 1=valid measurement **Data presence indicators relative to:** bit 2 Forward antenna 0=no for beam measurement 1=for beam measurement bit 3 Mid antenna 0=no mid beam measurement 1=mid beam measurement bit 4 Aftward antenna 0=no aft beam measurement 1=aft beam measurement bit 5 Land/sea flag 0=sea point 1=land point bit 6 Kp out of range (for beam) * 0=Kp out of range 1=Kp in range bit 7 Kp out of range (mid beam) * 0=Kp out of range 1=Kp in range bit 8 Kp out of range (aft beam) * 0=Kp out of range 1=Kp in range bit 9 Wind speed flag 0=wind speed value out of range 1=wind speed value in range	n.a.
4	5-8	I4	geographical latitude of node	1.E-4 deg
5	9-12	I4	geographical longitude of node	1.E-4 deg
6	13-14	I2	rank1 solution wind speed	cm/s
7	15-16	I2	rank1 solution wind direction	deg
8	17-18	I2	rank2 solution wind speed	cm/s
9	19-20	I2	rank2 solution wind direction	deg
10	21-22	I2	surface pressure difference of the node and the zero pressure reference node (see fields 27, 28 of SPH)	Pascal
11	23	I1	node subdivision class identifier *	n.a.

* Fields description :

Field 3 (Measurement confidence data)

bit 6,7,8 : The Kp value is out of range if it is greater than 20%.

bit 9 : The wind speed value is out of range if it is less than 4 m/s or greater than 24 m/s.

Field 11 : In case of processing with division techniques it identifies the sub-area to which the processed node belongs; if no subdivision techniques are used it is equal to 1.

Table 5.1 NULL VOLUME DESCRIPTOR RECORD

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	record sequence number	(1)
2	5	B1	1-st record subtype code	(192)
3	6	B1	record type code	(192)
4	7	B1	2-nd record subtype code	(63)
5	8	B1	3-rd record subtype code	(18)
6	9-12	B4	length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag	A$
8	15-16	A2	blanks	$$
9	17-28	A12	format control document	CCB-LBR-0001
10	29-30	A2	superstructure format control document	$E
11	31-32	A2	superstructure record format revision	$A
12	33-44	A12	logical volume generating facility software release and revision level	<software.id>
13	45-60	A16	ID of physical volume contatining this volume descriptor	<physical.tape.id>
14	61-76	A16	logical volume identifier	<logical.set.id>
15	77-92	A16	volume set identifier (product generation date) (YYYYMMMDDhhmmssdd, dd=deci-secs)	<volume.set.id>
16	93-94	I2	total number of physical volumes in the logical volume	$1
17	95-96	I2	physical volume sequence number of the first tape within the logical volume	$1
18	97-98	I2	physical volume sequence number of the larst tape within the logical volume	$1
19	99-100	I2	physical volume sequence number of the current tape within the logical volume	$1
20	101-104	I4	first referenced file number in this physical volume within the logical volume	$$$1
21	105-108	I4	logical volume within a volume set	$$$1
22	109-112	I4	logical volume number within physical volume	$$$1
23	113-120	A8	logical volume creation date (YYYYMMDD)	<YYYYMMDD>
24	121-128	A8	logical volume creation time (hhmmssdd, dd=deci-seconds)	<hhmmssdd>
25	129-140	A12	logical volume generating country	<country..>
26	141-148	A8	logical volume generating agency	<agency..>
27	149-160	A12	logical volume generating facility	<facility..>
28	161-164	I4	number of file pointer records in volume directory	$$$0
29	165-168	I4	number of records in volume directory	$$$1
30	169-260	A92	volume descriptor spare segment (always blank filled)	(blanks)
31	261-360	A100	local use segment	(blanks)