SAF NWC / MSG Output Products Format Definition

15 July 2013

Applicable to SAFNWC/MSG version 2013

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REPORT SIGNATURE TABLE

Function	Name	Signature	Date
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DOCUMENT CHANGE RECORD

Document code SAF/NWC/INM/SW/ICD/3			
Document code SAF/NWC/IOP/INM/SW/ICD/3			
			Updated sections: 3.12" Automatic Satellite Image Interpretation (ASII) Product" and 3.14 " Air Mass Analysis (AMA) Product" *Updated section 3.13 "Rapid Developing Thunderstorms (RDT) Product"* *Updated section 3.7 "Convective Rainfall Rate (CRR) Product"* *Updated section 3.8 "Total Precipitable Water (TPW) Product"* *Updated section 3.9 "Layer Precipitable Water (LPW) Product"* *Updated section 3.10 "Stability Analysis Imagery (SAI) Product"* *Updated sectioin 3.11 "High Resolution Winds (HRW) Product"*
			Updated PGE01. Cma_Test product definition and CMA_QUALITY list of values *Updated PGE02. CT_QUALITY list of values* *Updated PGE03. CTTH_QUALITY used method and CTTH_QUALITY list of values*

			Updated PGE06. Output product in 8 bits *Updated PGE07. Removed LPW_HEIGHT keyword* *Updated PGE08. Stored values are now in ºC* *Updated PGE09: new descriptors added in the BUFR product, removed old ones and updated some definitions.* *Minor corrections in PGE10 product description* *Updated PGE11. CTTH_HEIGHT replaced by CTTH_PRES* *Air mass classes description table for PGE12 has been updated*
			Note: Change bars apply to v0.1
			Note: Change bars apply to v1.2

			Note: Change bars apply to v1.2
Document code SAF/NWC/CDOP/INM/SW/ICD/3			
			Note: Change bars apply to v2.0
			Note: Change bars apply to v2.0
			Note: Track changes apply to v3.0

Document code SAF/NWC/CDOP2/INM/SW/ICD/3			

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Table 1: List of Applicable Documents

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1.5 DOCUMENT OVERVIEW

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2. GLOBAL SYSTEM OVERVIEW

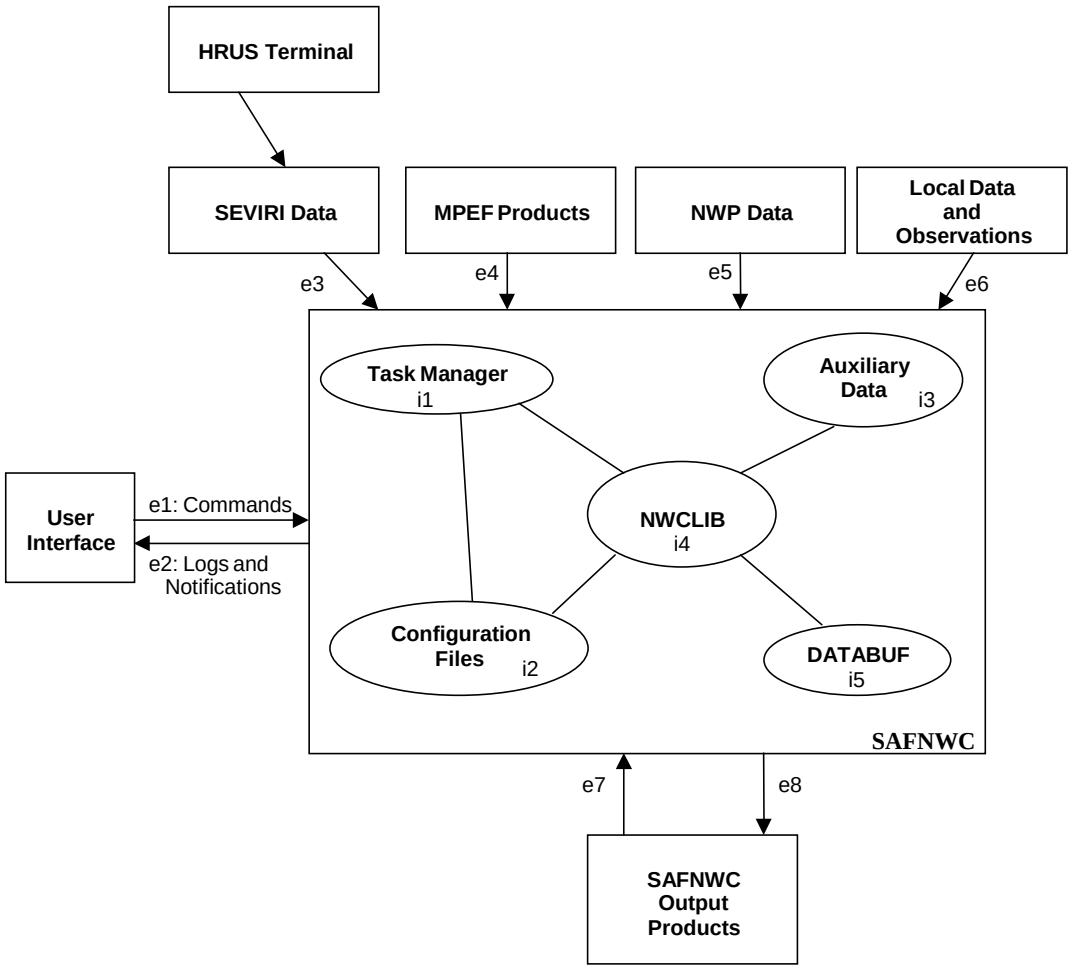


Figure 1: SAFNWC/MSG Interfaces

3. SAFNWC/MSG PRODUCTS FORMAT DEFINITION

Component	Acronym	Product Name	Product Format

Table 3: SEVIRI based SAFNWC/MSG products

3.1 SAFNWC/MSG PRODUCT NAMES

Field Name	Description	Data Type	Value
			i

Table 4: SAFNWC/MSG Output Products Names

```
SAFNWC_MSG1_CT___200708141430_SPAIN3_____.h5
```

3.2 STRUCTURE OF SAFNWC/MSG PRODUCTS FORMAT

-
-

- 

Figure 2: SAFNWC/MSG product format example

Attribute Name	Description	Value

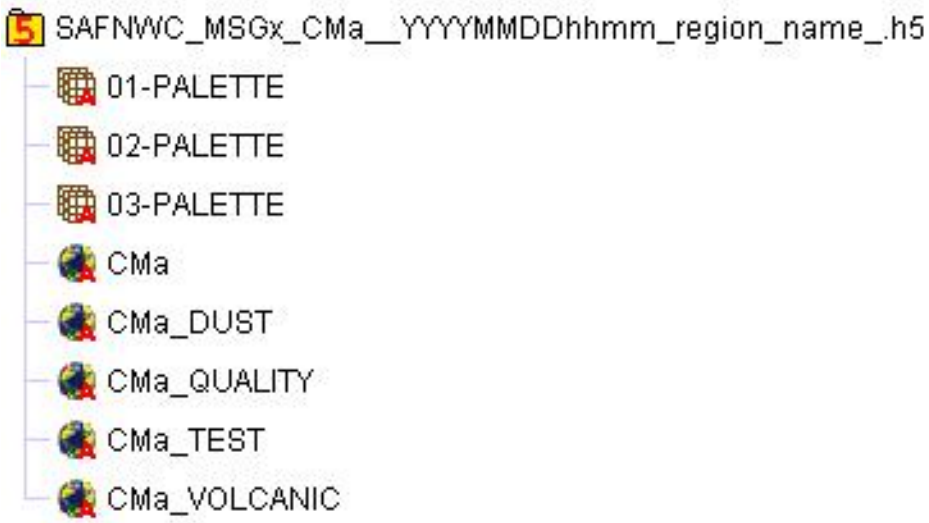
		λ=ϕ
		λ=ϕ

Table 5:SAFNWC product file general attributes

Attribute Name	Description	Value

Table 6: Product parameters attributes

3.3 CLOUD MASK (CMA) PRODUCT



01-PALETTE is applied to CMa parameter (see [AD.4.])
02-PALETTE is applied to CMa_DUST parameter (see [AD.4.])
03-PALETTE is applied to CMa_VOLCANIC parameter (see [AD.4.])

Figure 3: CMa product file structure

- **Cloud mask (CMa)**

- **Cloud mask tests (CMa_TEST)**

μ

μ μ

μ

μ μ

μ μ μ μ

μ μ

μ

μ

μ μ μ μ

μ μ

- **Quality (CMa_QUALITY)**

10	9	8	7	6	5	4	3	2	1	0

Ilumination

NWP_input_data

SEVIRI_input_data

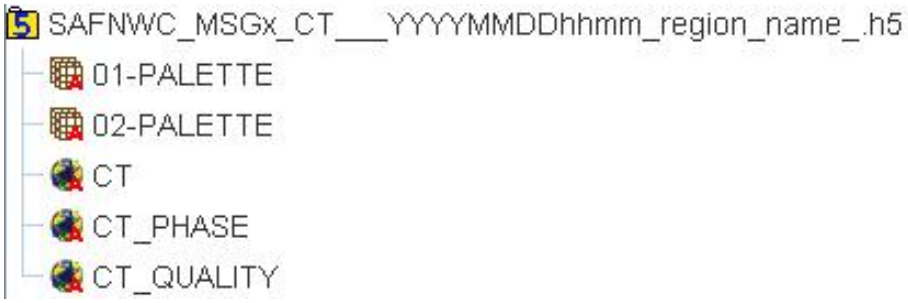
Temporal_flag:

HRV_flag:

- **Dust detection (CMa_DUST)**

- **Volcanic plume detection (CMa_VOLCANIC)**

3.4 CLOUD TYPE (CT) PRODUCT



01-PALETTE is applied to CT parameter (see [AD.4.])
02-PALETTE is applied to CT_PHASE parameter (see [AD.4.])

Figure 4: CT product file structure

- **Cloud type (CT)**

- **Quality (CT_QUALITY)**

9	8	7	6	5	4	3	2	1	0

Ilumination:

NWP_input_data:

SEVIRI_input_data:

Quality:

Separation:

- **Cloud phase (CT_PHASE)**

3.5 CLOUD TOP TEMPERATURE/HEIGHT (CTTH) PRODUCT

01-PALETTE is applied to CTTH_PRESS parameter (see [AD.4.])
02-PALETTE is applied to CTTH_HEIGHT parameter (see [AD.4.])
03-PALETTE is applied to CTTH_TEMPER parameter (see [AD.4.]))
04-PALETTE is applied to CTTH_EFFEC parameter (see [AD.4.])

Figure 5: CTTH product file structure

- **Cloud top pressure (CTTH_PRESSURE)**

- **Cloud top height (CTTH_HEIGHT)**

- **Cloud top temperature (CTTH_TEMPERATURE)**

- **Effective cloudiness (CTTH_EFFECTIVE)**

- **Quality (CTTH_QUALITY)**

13	12	11	10	9	8	7	6	5	4	3	2	1	0

Processing_status:

Rttov_sim:

NWP_input_data:

SEVIRI_input_data:

Method_used:

μ μ

μ μ

μ μ

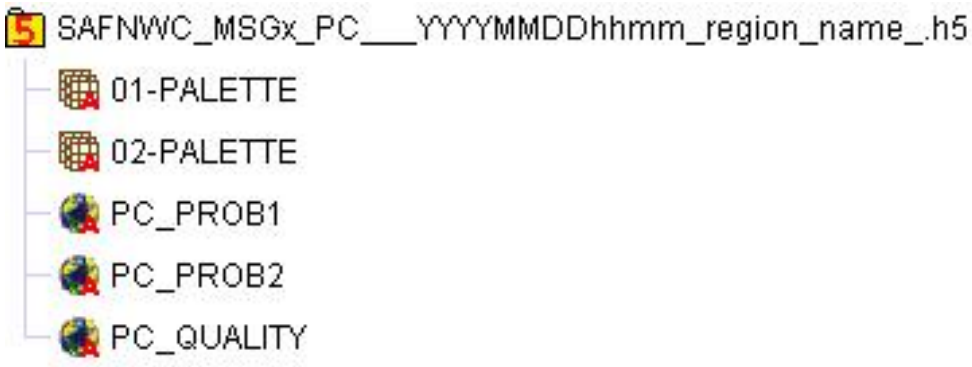
μ μ

μ μ

μ μ

Quality:

3.6 PRECIPITATING CLOUDS (PC) PRODUCT



01-PALETTE is applied to PC_PROB1 parameter (see [AD.4.])
02-PALETTE is applied to PC_PROB2 parameter (see [AD.4.])

Figure 6: PC product file structure

- **Total precipitation likelihood (PC_PROB1)**

- **PC_PROB2 : still available, but not used**

- **Quality (PC_QUALITY)**

Bit #	Meaning of the bit – 1/0

3.7 CONVECTIVE RAINFALL RATE (CRR) PRODUCT

01-PALETTE is applied to CRR parameter (see [AD.4.])
02-PALETTE is applied to CRR_ACCUM parameter (see [AD.4.])

Figure 7: CRR product file format

<table>
<tr><th>Parameter</th><th>Comment</th></tr>
<tr><td></td><td>
<table>
<tr><th>Class</th><th>Rainfall rate (mm/h)</th></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table>
</td></tr>
<tr><td></td><td>Scale = 0.2 Offset = 0</td></tr>
<tr><td></td><td>Scale = 0.2 Offset = 0</td></tr>
<tr><td></td><td>
<table>
<tr><th>Bit 7</th><th>Bit 6</th><th>Bit 5</th><th>Bit 4</th><th>Bit 3</th><th>Bit 2</th><th>Bit 1</th><th>Bit 0</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td></td><td>
<table>
<tr><th>Bit 7</th><th>Bit 6</th><th>Bit 5</th><th>Bit 4</th><th>Bit 3</th><th>Bit 2</th><th>Bit 1</th><th>Bit 0</th></tr>
<tr><td></td><td colspan="2"></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
</table>

Table 7: CRR parameters

SGSProductQuality = 100

*SGSProductCompleteness = (Number of pixels with no error / Total number of pixels) * 100*

3.8 HIGH RESOLUTION WIND VECTORS (HRW) PRODUCT

, Version August 2008.

3.8.1 NWCSAF BUFR template

3.8.1.1 Winds

SAFNWC_MSGx_HRW__YYYYMMDDhhmm_Region_____B.buf

SAFNWC_MSGx_HRW__YYYYMMDDhhmm_Region_____D.buf

Descriptor	Name	Units	Scale	Reference	Number of bits
001007	SATELLITE IDENTIFIER	CODE TABLE 001007	0	0	10
001031	IDENTIFICATION OF ORIGINATING/GENERATING CENTRE	CODE TABLE 001031	0	0	16
001032	GENERATING APPLICATION	CODE TABLE 001032	0	0	8
002023	SATELLITE DERIVED WIND COMPUTATION METHOD	CODE TABLE 002023	0	0	4
002057	ORIGIN OF FIRST GUESS INFORMATION	CODE TABLE 002057	0	0	4
002152	SATELLITE INSTRUMENT USED IN DATA PROCESSING	FLAG TABLE 002152	0	0	31
002153	SATELLITE CHANNEL CENTRE FREQUENCY	Hz	-8	0	26
002154	SATELLITE CHANNEL BAND WIDTH	Hz	-8	0	26
004001	YEAR	YEAR	0	0	12
004002	MONTH	MONTH	0	0	4
004003	DAY	DAY	0	0	6
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004025	TIME PERIOD OR DISPLACEMENT	MINUTE	0	-2048	12
005044	SATELLITE CYCLE NUMBER	NUMERIC	0	0	11
033035	MANUAL/AUTOMATIC QUALITY CONTROL	CODE TABLE 033035	0	0	4
060000	SEGMENT SIZE AT NADIR IN X DIRECTION (PIXELS)	PIX	0	0	7
060001	SEGMENT SIZE AT NADIR IN Y DIRECTION (PIXELS)	PIX	0	0	7
117000	REPLICATION OPERATOR[4]	-	0	0	0
031002	EXTENDED DELAYED DESCRIPTOR REPLICATION FACTOR (WINDS)	NUMERIC	0	0	16
060100	WIND SEQUENCE NUMBER	NUMERIC	0	0	24
060101	PRIOR WIND SEQUENCE NUMBER	NUMERIC	0	0	24
002028	SEGMENT SIZE AT NADIR IN X DIRECTION	M	-1	0	18
002029	SEGMENT SIZE AT NADIR IN Y DIRECTION	M	-1	0	18
002164	TRACER CORRELATION METHOD	CODE TABLE 002164	0	0	3
005001	LATITUDE (HIGH ACCURACY)	DEGREE	5	-9000000	25
006001	LONGITUDE (HIGH ACCURACY)	DEGREE	5	-18000000	26
005011	LATITUDE INCREMENT (HIGH ACCURACY)	DEGREE	5	-9000000	25
006011	LONGITUDE INCREMENT (HIGH ACCURACY)	DEGREE	5	-18000000	26
007004	PRESSURE	PA	-1	0	14
011001	WIND DIRECTION	DEGREE TRUE	0	0	9
011002	WIND SPEED	M/S	1	0	12
012001	TEMPERATURE	K	1	0	12
033007	PER CENT CONFIDENCE (WITH FORECAST TEST)	%	0	0	7
033007	PER CENT CONFIDENCE (WITHOUT FORECAST TEST)	%	0	0	7
060102	TRACER TYPE (CODE TABLE 060102)	CODE TABLE 060102	0	0	2
060103	HEIGHT ASSIGNMENT METHOD (CODE TABLE 060103)	CODE TABLE 060103	0	0	4
060200	NUMBER OF WINDS COMPUTED FOR THE TRACER	NUMERIC	0	0	3
060201	CORRELATION TEST (CODE TABLE 060201)	CODE TABLE 060201	0	0	3
060202	APPLIED QUALITY TESTS (CODE TABLE 060202)	CODE TABLE 060202	0	0	11
060203	NUMBER OF AVAILABLE NWP WIND GUESS LEVELS	NUMERIC	0	0	7
060204	NUMBER OF PREDECESSOR WINDS	NUMERIC	0	0	7
060205	OROGRAPHIC INDEX (CODE TABLE 060205)	CODE TABLE 060205	0	0	3

Replication descriptor 117000 describes the number of replication factors: 17

Descriptor	Name	Units	Scale	Reference	Number of bits
060206	CLOUD TYPE (SAFNWC/MSG)(CODE TABLE 060206)	CODE TABLE 060206	0	0	5
060207	WIND CHANNEL (SEVIRI CHANNEL ID) (CODE TABLE 060207)	CODE TABLE 060207	0	0	4
060208	CORRELATION	%	0	0	7
060209	PRESSURE ERROR	PA	-1	0	14

White entries: Fixed factors
Grey entries: Replicated factors

Table 8: HRW BUFR product description

Descriptor	Description
001007	
001031	
001032	
002023	
002057	

Descriptor	Description
002152	
002164	
033035	
060102	
060103	

Descriptor	Description
060201	
060202	
060205	
060206	
060207	

Table 9: Code table definition for HRW descriptors

3.8.1.2 Trajectories

SAFNWC_MSGx_HRW__YYYYMMDDhhmm_Region_____DTRAJ.buf

Descriptor	Name	Units	Scale	Reference	Number of bits
001007	SATELLITE IDENTIFIER	CODE TABLE 001007	0	0	10
001031	IDENTIFICATION OF ORIGINATING/GENERATING CENTRE	CODE TABLE 001031	0	0	16
001032	GENERATING APPLICATION	CODE TABLE 001032	0	0	8
002023	SATELLITE DERIVED WIND COMPUTATION METHOD	CODE TABLE 002023	0	0	4
002057	ORIGIN OF FIRST GUESS INFORMATION	CODE TABLE 002057	0	0	4
002152	SATELLITE INSTRUMENT USED IN DATA PROCESSING	FLAG TABLE 002152	0	0	31
002153	SATELLITE CHANNEL CENTRE FREQUENCY	Hz	-8	0	26
002154	SATELLITE CHANNEL BAND WIDTH	Hz	-8	0	26
004001	YEAR	YEAR	0	0	12
004002	MONTH	MONTH	0	0	4
004003	DAY	DAY	0	0	6
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004025	TIME PERIOD OR DISPLACEMENT	MINUTE	0	-2048	12
005044	SATELLITE CYCLE NUMBER	NUMERIC	0	0	11
033035	MANUAL/AUTOMATIC QUALITY CONTROL	CODE TABLE 033035	0	0	4
060000	SEGMENT SIZE AT NADIR IN X DIRECTION (PIXELS)	PIX	0	0	7
060001	SEGMENT SIZE AT NADIR IN Y DIRECTION (PIXELS)	PIX	0	0	7
060102	TRAJECTORY SEQUENCE NUMBER	NUMERIC	0	0	24
117000	REPLICATION OPERATOR[6]	-	0	0	0
031002	EXTENDED DELAYED DESCRIPTOR REPLICATION FACTOR (TRAJ. SECTORS)	NUMERIC	0	0	16
002164	TRACER CORRELATION METHOD	CODE TABLE 002164	0	0	3
005001	LATITUDE (HIGH ACCURACY)	DEGREE	5	-9000000	25
006001	LONGITUDE (HIGH ACCURACY)	DEGREE	5	-18000000	26
005011	LATITUDE INCREMENT (HIGH ACCURACY)	DEGREE	5	-9000000	25
006011	LONGITUDE INCREMENT (HIGH ACCURACY)	DEGREE	5	-18000000	26
007004	PRESSURE	PA	-1	0	14
011001	WIND DIRECTION	DEGREE TRUE	0	0	9
011002	WIND SPEED	M/S	1	0	12
012001	TEMPERATURE	K	1	0	12
033007	PER CENT CONFIDENCE (WITH FORECAST TEST)	%	0	0	7
033007	PER CENT CONFIDENCE (WITHOUT FORECAST TEST)	%	0	0	7
060103	HEIGHT ASSIGNMENT METHOD (CODE TABLE 060103)	CODE TABLE 060103	0	0	4
060205	OROGRAPHIC INDEX (CODE TABLE 060205)	CODE TABLE 060205	0	0	3
060206	CLOUD TYPE (SAFNWC/MSG)	CODE TABLE 060206	0	0	5
060207	WIND CHANNEL (SEVIRI CHANNEL ID)	NUMERIC	0	0	4
060208	CORRELATION	%	0	0	7
060209	PRESSURE ERROR	PA	-1	0	14

White entries: Fixed factors
Grey entries: Replicated factors

3.8.2 EUMETSAT BUFR template

SAFNWC_MSGx_HRW__YYYYMMDDhhmm_Region_____BEUM.buf

SAFNWC_MSGx_HRW__YYYYMMDDhhmm_Region_____DEUM.buf

Descriptor	Name	Units	Scale	Reference	Number of bits
001007	SATELLITE IDENTIFIER	CODE TABLE 1007	0	0	10
001031	IDENTIFICATION OF ORIGINATING/GENERATING CENTRE	CODE TABLE 1031	0	0	16
002020	SATELLITE CLASSIFICATION	CODE TABLE 2020	0	0	9
002028	SEGMENT SIZE AT NADIR IN X DIRECTION	M	0	0	18
002029	SEGMENT SIZE AT NADIR IN Y DIRECTION	M	0	0	18
004001	YEAR	YEAR	0	0	12
004002	MONTH	MONTH	0	0	4
004003	DAY	DAY	0	0	6
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004006	SECOND	SECOND	0	0	6
005001	LATITUDE (HIGH ACCURACY)	DEGREE	5	-9000000	25
006001	LONGITUDE (HIGH ACCURACY)	DEGREE	5	-18000000	26
002152	SATELLITE INSTRUMENT DATA USED IN PROCESSING	FLAG TABLE 2152	0	0	31
002023	SATELLITE DERIVED WIND COMPUTATION METHOD	CODE TABLE 2023	0	0	4
007004	PRESSURE	PA	-1	0	14
011001	WIND DIRECTION	DEGREE TRUE	0	0	9
011002	WIND SPEED	M/S	1	0	12
002153	SATELLITE CHANNEL CENTRE FREQUENCY	Hz	-8	0	26
002154	SATELLITE CHANNEL BAND WIDTH	Hz	-8	0	26
012071	COLDEST CLUSTER TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
002164	TRACER CORRELATION METHOD	CODE TABLE 2164	0	0	3
008012	LAND/SEA QUALIFIER	CODE TABLE 8012	0	0	2
007024	SATELLITE ZENITH ANGLE	DEGREE	2	-9000	15
002057	ORIGIN OF FIRST GUESS INFORMATION	CODE TABLE 2057	0	0	4
008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004001	YEAR	YEAR	0	0	12
004002	MONTH	MONTH	0	0	4
004003	DAY	DAY	0	0	6
004004	HOUR	HOUR	0	0	5
008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004024	TIME PERIOD OR DISPLACEMENT	HOUR	0	-2048	12
008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004006	SECOND	SECOND	0	0	6
008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004006	SECOND	SECOND	0	0	6
011001	WIND DIRECTION	DEGREE TRUE	0	0	9
011002	WIND SPEED	M/S	1	0	12

008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004006	SECOND	SECOND	0	0	6
008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004006	SECOND	SECOND	0	0	6
011001	WIND DIRECTION	DEGREE TRUE	0	0	9
011002	WIND SPEED	M/S	1	0	12
008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004006	SECOND	SECOND	0	0	6
008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004006	SECOND	SECOND	0	0	6
011001	WIND DIRECTION	DEGREE TRUE	0	0	9
011002	WIND SPEED	M/S	1	0	12
008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004006	SECOND	SECOND	0	0	6
008021	TIME SIGNIFICANCE	CODE TABLE 8021	0	0	5
004004	HOUR	HOUR	0	0	5
004005	MINUTE	MINUTE	0	0	6
004006	SECOND	SECOND	0	0	6
011001	WIND DIRECTION	DEGREE TRUE	0	0	9
011002	WIND SPEED	M/S	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
002163	HEIGHT ASSIGNMENT METHOD	CODE TABLE 2163	0	0	4
007004	PRESSURE	PA	-1	0	14
012001	TEMPERATURE/DRY BULB TEMPERATURE	K	1	0	12
222000	QUALITY INFORMATION FOLLOWS				
236000	DEFINE BIT-MAP				
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1

031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
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031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
031031	DATA PRESENT INDICATOR	FLAG TABLE 31031	0	0	1
001031	IDENTIFICATION OF ORIGINATING/GENERATING CENTRE	CODE TABLE 1031	0	0	16
001032	GENERATING APPLICATION (QUALITY CONTROL USING FORECAST)	CODE TABLE 1032	0	0	8
033007	% CONFIDENCE	%	0	0	7
033007	% CONFIDENCE	%	0	0	7
033007	% CONFIDENCE	%	0	0	7
033007	% CONFIDENCE	%	0	0	7
222000	QUALITY INFORMATION FOLLOWS				
237000	REUSE PREVIOUSLY DEFINED BIT-MAP				
001031	IDENTIFICATION OF ORIGINATING/GENERATING CENTRE	CODE TABLE 1031	0	0	16
001032	GENERATING APPLICATION (QUALITY CONTROL USING FORECAST)	CODE TABLE 1032	0	0	8
033035	MANUAL-AUTOMATIC QUALITY CONTROL	CODE TABLE 33035	0	0	4
033035	MANUAL-AUTOMATIC QUALITY CONTROL	CODE TABLE 33035	0	0	4
033035	MANUAL-AUTOMATIC QUALITY CONTROL	CODE TABLE 33035	0	0	4
033035	MANUAL-AUTOMATIC QUALITY CONTROL	CODE TABLE 33035	0	0	4
222000	QUALITY INFORMATION FOLLOWS				
237000	REUSE PREVIOUSLY DEFINED BIT-MAP				
001031	IDENTIFICATION OF ORIGINATING/GENERATING CENTRE	CODE TABLE 1031	0	0	16
001032	GENERATING APPLICATION (QUALITY CONTROL USING FORECAST)	CODE TABLE 1032	0	0	8
033036	NOMINAL CONFIDENCE THRESHOLD	%	0	0	7
033036	NOMINAL CONFIDENCE THRESHOLD	%	0	0	7
033036	NOMINAL CONFIDENCE THRESHOLD	%	0	0	7
033036	NOMINAL CONFIDENCE THRESHOLD	%	0	0	7
222000	QUALITY INFORMATION FOLLOWS				
237000	REUSE PREVIOUSLY DEFINED BIT-MAP				
001031	IDENTIFICATION OF ORIGINATING/GENERATING CENTRE	CODE TABLE 1031	0	0	16
001032	GENERATING APPLICATION (QUALITY CONTROL WITHOUT FORECAST)	CODE TABLE 1032	0	0	8
033036	% CONFIDENCE THRESHOLD	%	0	0	7
033036	% CONFIDENCE THRESHOLD	%	0	0	7
033036	% CONFIDENCE THRESHOLD	%	0	0	7
033036	% CONFIDENCE THRESHOLD	%	0	0	7
222000	QUALITY INFORMATION FOLLOWS				
237000	REUSE PREVIOUSLY DEFINED BIT-MAP				
001031	IDENTIFICATION OF ORIGINATING/GENERATING CENTRE	CODE TABLE 1031	0	0	16
001032	GENERATING APPLICATION (QUALITY CONTROL WITHOUT FORECAST)	CODE TABLE 1032	0	0	8
033035	MANUAL-AUTOMATIC QUALITY CONTROL	CODE TABLE 33035	0	0	4
033035	MANUAL-AUTOMATIC QUALITY CONTROL	CODE TABLE 33035	0	0	4
033035	MANUAL-AUTOMATIC QUALITY CONTROL	CODE TABLE 33035	0	0	4
033035	MANUAL-AUTOMATIC QUALITY CONTROL	CODE TABLE 33035	0	0	4
222000	QUALITY INFORMATION FOLLOWS				
237000	REUSE PREVIOUSLY DEFINED BIT-MAP				
001031	IDENTIFICATION OF ORIGINATING/GENERATING CENTRE	CODE TABLE 1031	0	0	16
001032	GENERATING APPLICATION (QUALITY CONTROL WITHOUT FORECAST)	CODE TABLE 1032	0	0	8
033036	NOMINAL CONFIDENCE THRESHOLD	%	0	0	7
033036	NOMINAL CONFIDENCE THRESHOLD	%	0	0	7
033036	NOMINAL CONFIDENCE THRESHOLD	%	0	0	7
033036	NOMINAL CONFIDENCE THRESHOLD	%	0	0	7

3.9 AUTOMATIC SATELLITE IMAGE INTERPRETATION (ASII) PRODUCT

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Field Name	Description	Data Type	Value
			i *i*

Table 10: File name components of PGE10 ASII output

warm front
cold front
cold front under warm air advection
front intensification by jet streak crossing
enhanced cumuli
dry intrusion
cold air cloudiness
mature cumulonimbus
growing cumulonimbus
decaying cumulonimbus
occlusion
comma
non-developing wave
developing wave
upper wave
upper level low
mesoscale convective system
lee cloudiness
jet cloud (fibres)
embedded convective cell

Field Name	Description	Data Type	Value
			i *i*

Table 11: File name components of PGE10 AMV output

```
103000  SPECIFICATION OF THE REPLICATION
031002  EXTENDED DELAYED DESCRIPTOR REPLICATION FACTOR
301023  expands to:
      005002  LATITUDE (COARSE ACCURACY)
      006002  LONGITUDE (COARSE ACCURACY)
011003  U-COMPONENT
011004  V-COMPONENT
```

3.10 RAPID DEVELOPING THUNDERSTORMS (RDT) PRODUCT

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-
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-
-
-
-
- *their content is reminded and highlighted in grey*

3.13.1 - BUFR Version 1

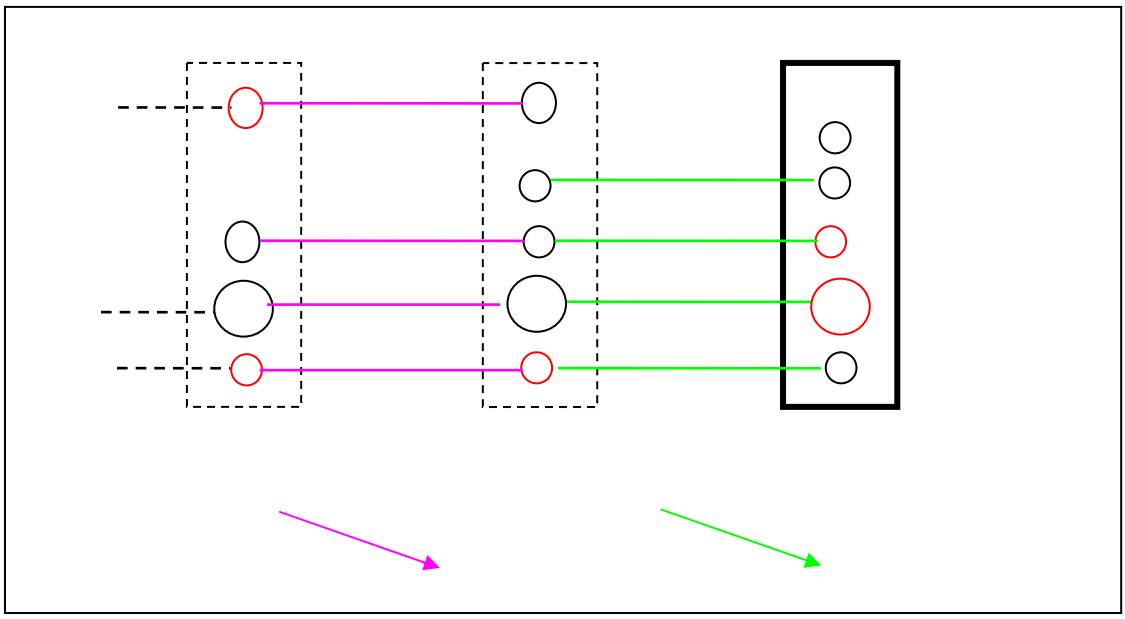

Figure : Illustration and key of temporal links between cells with successive version 1 of BUFR RDT products. Products contain all detected and tracked cells (convectives symbolized in red)

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance

Cells description lines / epetition cycle Data type

Table 12: RDT BUFR product description

3.13.2 - BUFR Version 2

–bufr 2

–bufr –2

–bufr_histo

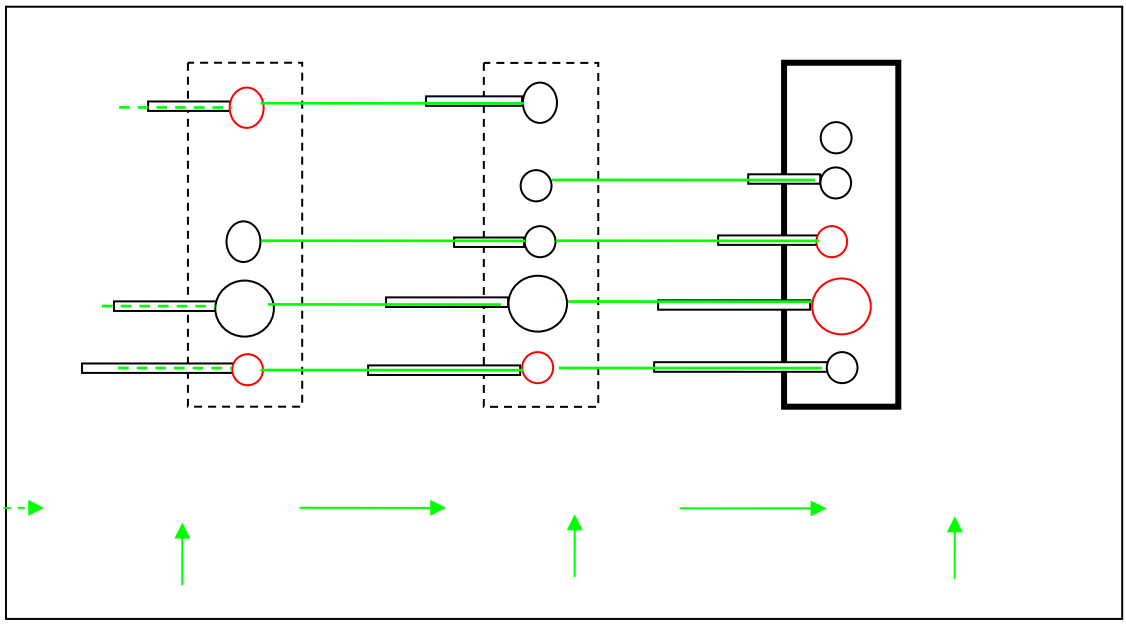

Figure : Illustration and key of temporal links between cells with successive version 2 of BUFR RDT products. Included temporal series of parameters illustrated by thin rectangle, length depending on cell's history and software limit (default 180 min, tunable through –bufr_histo argument)

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance
	301011					
	004001	*0*	*0*	*12*	*Year*	*Year*
	004002	*0*	*0*	*4*	*Month*	*Month*
	004003	*0*	*0*	*6*	*Day*	*Day*
	301012					
	004004	*0*	*0*	*5*	*Hour*	*Hour*
	004005	*0*	*0*	*6*	*Minute*	*Minute*
	301011					
	004001	*0*	*0*	*12*	*Year*	*Year*
	004002	*0*	*0*	*4*	*Month*	*Month*
	004003	*0*	*0*	*6*	*Day*	*Day*
	301012					
	004004	*0*	*0*	*5*	*Hour*	*Hour*
	004005	*0*	*0*	*6*	*Minute*	*Minute*
	301023					
	005002	*2*	*-9000*	*15*	*Degree*	*Latitude*
	006002	*2*	*-18000*	*16*	*Degree*	*Longitude*
	301023					
	005002	*2*	*-9000*	*15*	*Degree*	*Latitude*
	006002	*2*	*-18000*	*16*	*Degree*	*Longitude*
	5			**3**		
	033007					
	2			**16**		**number**
	2			**16**		**number** **at birth**
	301011					
	004001	*0*	*0*	*12*	*Year*	*Year*
	004002	*0*	*0*	*4*	*Month*	*Month*
	004003	*0*	*0*	*6*	*Day*	*Day*
	301013					
	004004	*0*	*0*	*5*	*Hour*	*Hour*
	004005	*0*	*0*	*6*	*Minute*	*Minute*
	004006	*0*	*0*	*6*	*Second*	*Second*

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance
	301011					
	004001	*0*	*0*	*12*	*Year*	*Year*
	004002	*0*	*0*	*4*	*Month*	*Month*
	004003	*0*	*0*	*6*	*Day*	*Day*
	301012					
	004004	*0*	*0*	*5*	*Hour*	*Hour*
	004005	*0*	*0*	*6*	*Minute*	*Minute*
	106000	**0**	**0**	**0**		**Replication operator**
	031001	**0**	**0**	**8**	**Numeric**	**Number of historical cells to follow**
	004025	**0**	**-2048**	**12**	**Minute**	**Time interval of the following with the current cell**
	301023					
	005002	*2*	*-9000*	*15*	*Degree*	*Latitude*
	006002	*2*	*-18000*	*16*	*Degree*	*Longitude*
	104000	**0**	**0**	**0**		**Replication operator**
	031001	**0**	**0**	**8**	**Numeric**	**Number of historical steps to follow**
	004025	**0**	**-2048**	**12**	**Minute**	**Time interval of the following with the current cell**

Cells description lines
Repetition cycle
Data type
Dimensional indicator of the described object (Cell)

Table 13: RDT BUFR product description - version 2

3.13.3 - BUFR Version 1 or 2 with production number

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance
3	008022	0	0	16	Numeric	Total number (with respect to accumulation or average)
4						
5						

3.13.4 – BUFR Version 3

–bufr 3 -3

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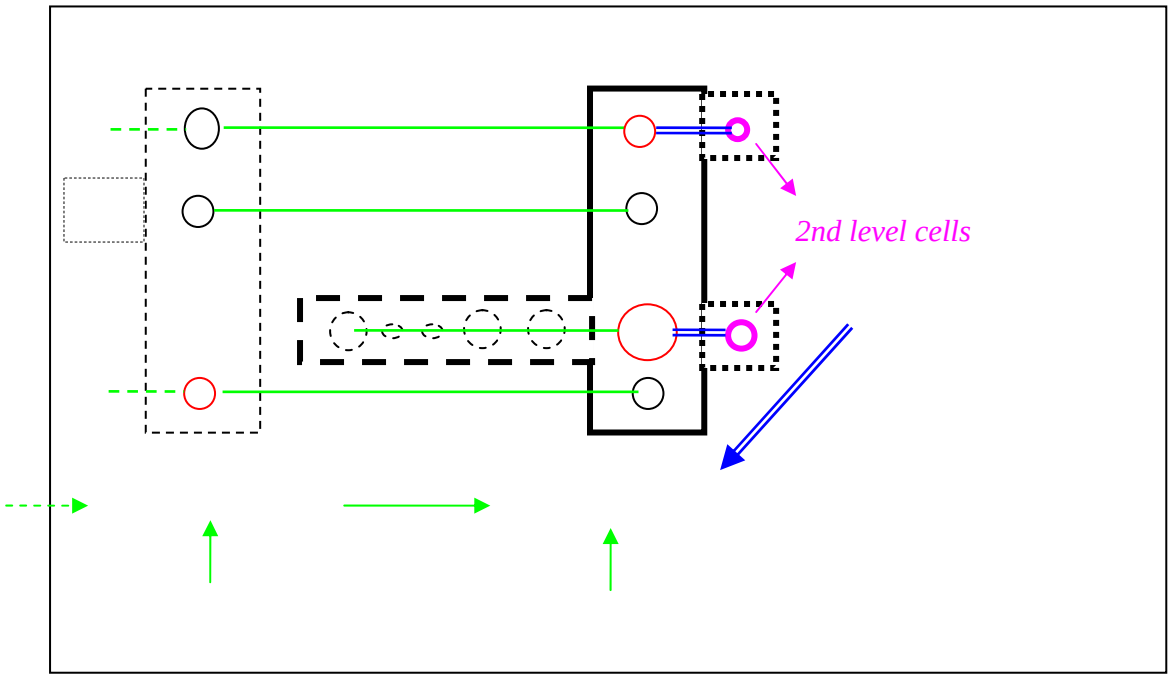

Figure : version 3 of BUFR RDT : Illustration and key of temporal links between successive cells of successive products, (or between included previous cells of newly significant if option "–bufr -3"). Illustration and key of link between main cell and second level cell (magenta)

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance
0 *0* *0*	*004001* *004002* *004003*	*0* *0* *0*	*0* *0* *0*	*12* *4* *6*	*Year* *Month* *Day*	*Year* *Month* *Day*

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance
0	004004	0	0	5	Hour	Hour
0	004005	0	0	6	Minute	Minute
0	004001	0	0	12	Year	Year
0	004002	0	0	4	Month	Month
0	004003	0	0	6	Day	Day
0	004004	0	0	5	Hour	Hour
0	004005	0	0	6	Minute	Minute
						(4)
0	005002	2	-9000	15	Degree	Latitude
0	006002	2	-18000	16	Degree	Longitude
0	005002	2	-9000	15	Degree	Latitude
0	006002	2	-18000	16	Degree	Longitude
0	005002	2	-9000	15	Degree	Latitude
0	006002	2	-18000	16	Degree	Longitude
0	004001	0	0	12	Year	Year
0	004002	0	0	4	Month	Month
0	004003	0	0	6	Day	Day
0	004004	0	0	5	Hour	Hour
0	004005	0	0	6	Minute	Minute
0	004006	0	0	6	Second	Second
0	004001	0	0	12	Year	Year
0	004002	0	0	4	Month	Month

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance
0	*004003*	*0*	*0*	*6*	*Day*	*Day*
0	*004004*	*0*	*0*	*5*	*Hour*	*Hour*
0	*004005*	*0*	*0*	*6*	*Minute*	*Minute*

Cells description lines
Repetition cycle
Data type
Dimensional indicator of the described object (Cell)

Table 18: RDT BUFR product description - version 3

3.13.4 – BUFR Version 4

–bufr 4 -4

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008003-Descriptor of vertical characteristic *(top of cloud)*

105000-Replication descriptor for 5 next descriptors

031001 Descriptor of number of overshoot described in the cell

301023- Position descriptor

012063-brightness temperature descriptor

012065-standard deviation of brightness temperature, used to code BTD

012065-standard deviation of brightness temperature, used to code gap to surrounding tropopause

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance
	63					63
						s

N°	Descriptor	Scale	Ref. value	Data bit width	Unit	Significance
	005002	2	-9000	15	Degree	Latitude
	006002	2	-18000	16	Degree	Longitude

Table 19: RDT BUFR product description – difference of version 4 with version 3

3.13.5 – Description of local descriptors and Comments

Local descriptors used: descriptor: *unit* **:**

- **001220** *CCITTIA5*
- **001222** *numeric*
- **007193** *K*
- **008193** *code table*

Code figure	Meaning
	Not used

- **008200** *code table*

Code figure	Meaning

- **008201** *code table*

Code figure	Meaning

- **008205** *code table*

Code figure	

- **012250** *K/s*
- **016193** *numeric*
- **016194** *numeric*
- **016195** *numeric*
- **019191:** *m*
- **019192:** *m*
- **019193:** *Degree true*
- **019194** m^2
- **019200** */s*
- **020224** *code table*

Code figure	Meaning

- **025228** *code table*

Code figure	Meaning

- **025229**

CCITTIA5

- **033230** *code table*

Code figure	Meaning

- **033231** *code table*

Code figure	Meaning

- **033232** *code table*

Code figure	Meaning

Comments:

Code figure	Meaning

For a given RDT product, its value is always 16 and the date of validity of the cloud systems objects is the date of the scan of the pixel located at the center of the region used to compute this RDT product.

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- **SAT**
- **LGH**
- **CRR**
- **OTD** ≥

LGH”

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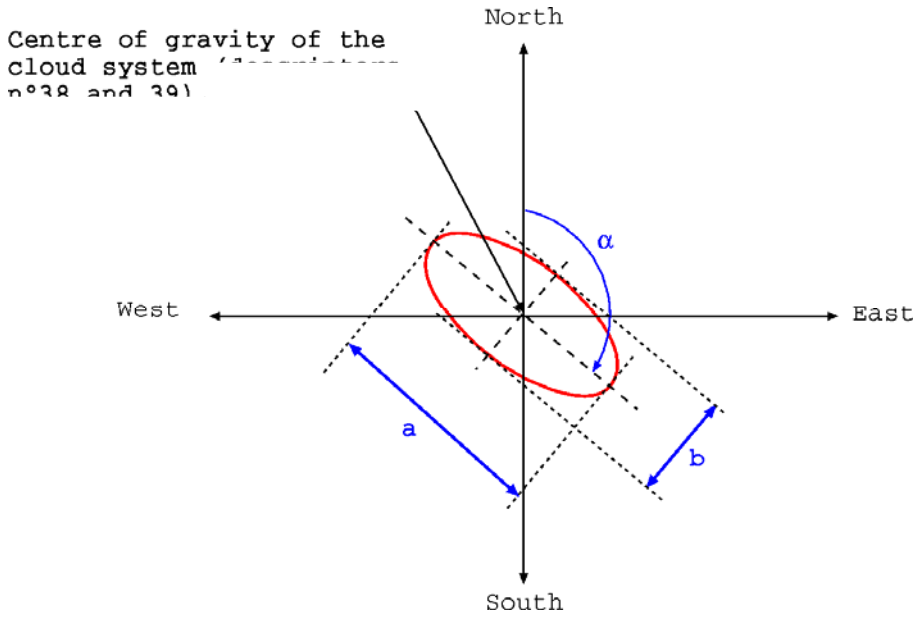
  a
-
  b
- α


Centre of gravity of the
cloud system
North
West
East
South
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a
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3.13.6 - Cloud Trajectory format

- *YYYYMM region_name Tcold Twarm delta_tempe SURFMIN*
- *YYYYMMDD region_name Tcold Twarm delta_tempe SURFMIN*
- *YYYYMMDDHHmm region_name Tcold Twarm delta_tempe SURFMIN*

- o
- o
- o
- o
- o

1. **Line “T”**

internal use

internal use
internal use
internal use

2. Line “I”

internal use

3. Line “S” (or “S2”)

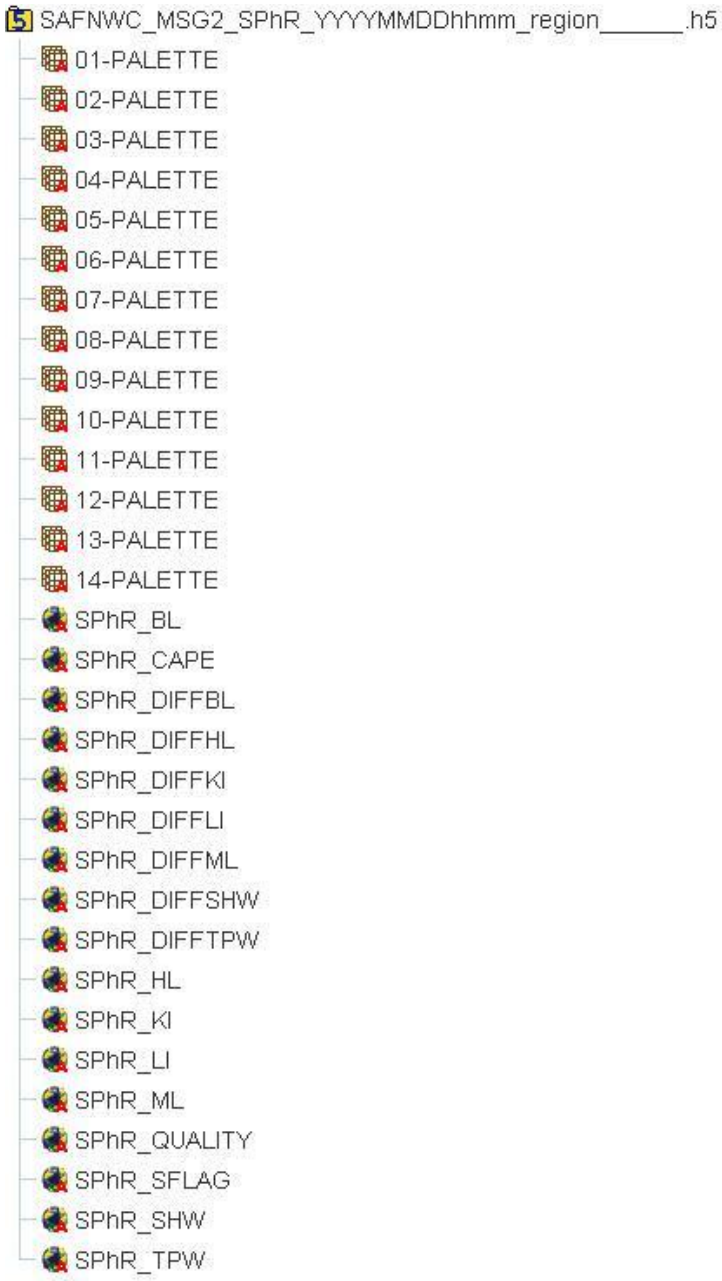
4. Line “X”

5. Line “O”

6. Line “H”

7. Line “L”

3.11 SEVIRI PHYSICAL RETRIEVAL (SPHR) PRODUCT



01-PALETTE is applied to the BL (see [AD.4.])
02-PALETTE is applied to the ML (see [AD.4.])
03-PALETTE is applied to the HL (see [AD.4.])
04-PALETTE is applied to the LI (see [AD.4.])
05-PALETTE is applied to the TPW (see [AD.4.])
06-PALETTE is applied to the SPhR_DIFFBL (see [AD.4.])
07-PALETTE is applied to the SPhR_DIFFML (see [AD.4.])
08-PALETTE is applied to the SPhR_DIFFHL (see [AD.4.])
09-PALETTE is applied to the SPhR_DIFFLI (see [AD.4.])
10-PALETTE is applied to the SPhR_DIFFKI (see [AD.4.])
11-PALETTE is applied to the SPhR_DIFFTPW (see [AD.4.])
12-PALETTE is applied to the SPhR_DIFFSHW (see [AD.4.])
13-PALETTE is applied to the SPhR_KI (see [AD.4.])
14-PALETTE is applied to the SPhR_SHW (see [AD.4.])

Figure 8: SPhR product file structure

Parameter	Comment
	Scale = 35/119 *Offset = -8 * 35/119*
	Scale = 45/119 *Offset = -8 * 45/119*
	Scale = 8/119 *Offset = -8 * 8/119*
	Scale = 70/119 *Offset = -8 * 70/119*

Parameter	Comment
	Scale = 3/119 *Offset = -1.5 – (8*3/119)*
	Scale = 5/119 *Offset = -2.5 – (8*5/119)*
	Scale = 1.5/119 *Offset = -0.75 – (8*1.5/119)*
	Scale = 4/119 *Offset = -1 –(8*5/119)*
	Scale = 5/119 *Offset = -2.5 – (8*5/119)*

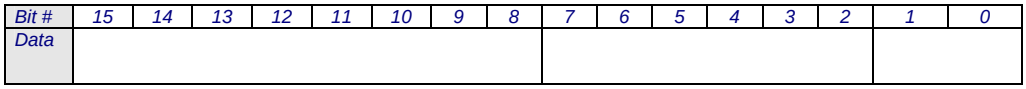
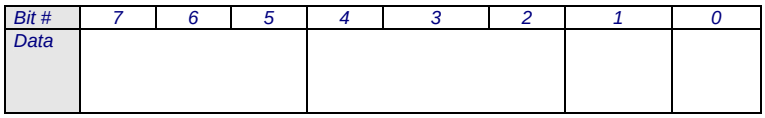
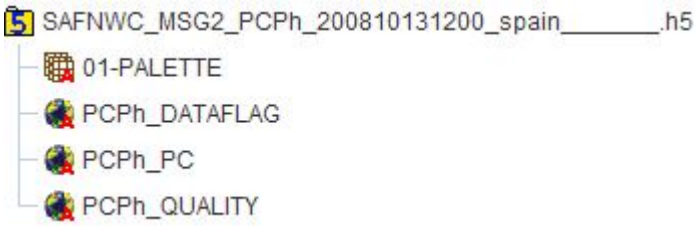
Parameter	Comment
	*Scale = 14/119 Offset = -7 – (8*14/119)*
	*Scale = 5/119 Offset = -2.5 – (8*5/119)*
	 *Delta BT RMS: Root mean square of differences between the SEVIRI and calculated brightness temperature.* *gamf: Gamma parameter* *Convergency error: Number of iterations where the convergency has failed.*
	 *Cloudy flag:* *Status Retrieval flag:* *Retrieval iterations:*

Table 14: SPhR parameters

3.12 PRECIPITATION PRODUCTS FROM PHYSICAL PROPERTIES (PPH)

3.12.1 Precipitating Clouds from Physical Properties (PCPh)



01-PALETTE is applied to the PC(see [AD.4.])

Figure 9: PCPh product file structure

- **PCPh_PC: Total precipitation likelihood**

- **PCPh_DATAFLAG**

1: A mathematical error has occurred

0	1	2	3	4	5	6	7
For Reff, COT or Phase data missing	For Reff or COT no computed (Out of the cloud, night time or undefined phase)	To indicate if phase has been computed (*)	For 10.8IR data missing (mandatory for parallax correction)	To identify mathematical errors			

x PCPh_QUALITY:

2 bits mask indicating if parallax correction has been applied for each pixel:

1 bit for parallax correction:

0: No correction

1: Corrected by parallax

1 bit for the filled holes after parallax correction

0: No hole due to the parallax correction

1: Hole due to the parallax correction filled by a median filter

0	1	3	2	4	5	6	7
Parallax Correction	Filled holes alter parallax correction						

The CRPh product files structure is shown below:

02-PALETTE is applied to the CRR(see [AD.4.])
03-PALETTE is applied to the ACUM(see [AD.4.])
04-PALETTE is applied to the IQF(see [AD.4.])

Figure 10: CRPh product file structure

Five different parameters are given:

Parameter	Comment
CRPh_CRR	Convective Rainfall Rate intensity CRPh_CRR(mm/h) = Scale * Counts + Offset Where: Scale = 0.2 Offset = 0

	Scale = 0.2 *Offset = 0*
	<table><tr><td>*Bit 0*</td><td>*Bit 1*</td><td>*Bit 3*</td><td>*Bit 2*</td><td>*Bit 4*</td><td>*Bit 5*</td><td>*Bit 6*</td><td>*Bit 7*</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>

Bit 0	Bit 1	Bit 3	Bit 2	Bit 4	Bit 5	Bit 6	Bit 7

Table 15: CRPh parameters