

CODE TABLE USED IN SECTION 0

Code table 0.0 - Discipline of processed data in the GRIB message, number of GRIB Master table

Code figure	Meaning	Status
3	Space products	Operational
3	<i>Satellite remote sensing products</i>	<i>Validation</i>
4-9	Reserved	Operational
4	<i>Space weather products</i>	<i>Validation</i>
5-9	<i>Reserved</i>	<i>Validation</i>

CODE TABLES USED IN SECTION 1

Code table 1.5 - Identification template number

<i>Code figure</i>	<i>Meaning</i>	<i>Status</i>
0	Calendar definition	Validation
1	Paleontological offset	Validation
2-32767	Reserved	Validation
32768-65534	Reserved for local use	Validation
65535	Missing	Validation

Code table 1.6 - Type of calendar

<i>Code figure</i>	<i>Meaning</i>	<i>Status</i>
0	Gregorian	Validation
1	360-day	Validation
2-254	Reserved	Validation
255	Missing (assume Gregorian)	Validation

CODE TABLES USED IN SECTION 3

Code table 3.1 - Grid definition template number

Code figure	Meaning	Comments	Status
4-9	Reserved		Operational
<i>4</i>	<i>Variable resolution latitude/longitude</i>		<i>Validation</i>
<i>5</i>	<i>Variable resolution rotated latitude/longitude</i>		<i>Validation</i>
<i>6-9</i>	<i>Reserved</i>		<i>Validation</i>
11-19	Reserved		Operational
<i>11</i>	<i>Rotated Mercator projection</i>		<i>Validation</i>
<i>12-19</i>	<i>Reserved</i>		<i>Validation</i>
101-109	Reserved		Operational
<i>101</i>	<i>General unstructured grid</i>		<i>Validation</i>
<i>102-109</i>	<i>Reserved</i>		<i>Validation</i>

Code table 3.2 - Shape of the Earth *

Code figure	Meaning	Status
9-191	Reserved	Operational
<i>9</i>	<i>Earth represented by the OSGB 1936 Datum, using the Airy_1830 Spheroid, the Greenwich meridian as 0 longitude, the Newlyn datum as mean sea level, 0 height</i>	<i>Validation</i>
<i>10</i>	<i>Earth model assumed WGS84 with corrected geomagnetic coordinates (latitude and longitude) defined by Gustafsson et al.,</i>	<i>Validation</i>
<i>11</i>	<i>Sun assumed spherical with radius = 695,990,000 m (Allen, C.W., 1976 Astrophysical Quantities (3rd Ed.; London: Athlone)) and Stonyhurst latitude and longitude system with origin at the intersection of the solar central meridian (as seen from Earth) and the solar equator (Thompson, W, Coordinate systems for solar image data, A&A 449, 791-803 (2006)).</i>	<i>Validation</i>
<i>12</i>	<i>Sun assumed spherical with radius = 695,990,000 m (Allen, C.W., 1976 Astrophysical Quantities (3rd Ed.; London: Athlone)) and Carrington latitude and longitude system that rotates with a sidereal period of 25.38 days (Thompson, W, Coordinate systems for solar image data, A&A 449, 791-803 (2006)).</i>	<i>Validation</i>
<i>13-191</i>	<i>Reserved</i>	<i>Validation</i>

[Validation] Modify the title to "Shape of the reference system".

Flag table 3.4 - Scanning mode

Bit No.	Value	Meaning	Status
5	0	Points within adjacent rows are not staggered	Validation
	1	Points within adjacent rows are staggered according to bit 6	Validation
6	0	Points within even rows are offset by +0.5 in i (x) direction	Validation
	1	Points within even rows are offset by -0.5 in i (x) direction	Validation
7	0	All rows have same number of data points	Validation
	1	Adjacent rows have different numbers of data points according to bit	Validation
8	0	Odd rows contain Ni-1 data points	Validation
	1	Even rows contain Ni-1 data points	Validation

Notes:

[Validation] (x) Bits 5-8 may be used with template 3.1 to define an Arakawa grid with an “E” stagger.

[Validation] (x+1) The value of bit 6 only has meaning when bit 5 is set.

[Validation] (x+2) The value of bit 8 only has meaning when bit 7 is set.

Code table 3.15 - Physical meaning of vertical coordinate

Code figure	Meaning	Unit	Status
none			

CODE TABLES USED IN SECTION 4

Code table 4.0 - Product definition template number

Code figure	Meaning	Status
48-50	Reserved	Operational
48	Analysis or forecast at a horizontal level or in a horizontal layer at a point in time for optical properties of aerosol	Validation
49	Reserved	Validation
50	Analysis or forecast of a multi component parameter or matrix element at a point in time	Validation

Code table 4.1 - Parameter category by product discipline

Product discipline 3 - Space products *

Category	Description	Status
0	Image format products (see Note 1)	Operational
1	Quantitative products (see Note 2)	Operational
2-191	Reserved	Operational
192-254	Reserved for local use	Operational
255	Missing	Operational

[Validation] * Modify the title to "Satellite remote sensing products".

Product discipline 4 - Space weather products

Category	Description	Status
0	Temperature	Validation
1	Momentum	Validation
2	Charged particle mass and number	Validation
3	Electric and magnetic fields	Validation
4	Energetic particles	Validation
5	Waves	Validation
6	Solar electromagnetic emissions	Validation
7	Terrestrial electromagnetic emissions	Validation
8	Imagery	Validation
9	Ion-neutral coupling	Validation
10-191	Reserved	Validation
192-254	Reserved for local use	Validation
255	Missing	Validation

Code table 4.2 - Parameter number by product discipline and parameter category

Product discipline 0 - Meteorological products, parameter category 0: temperature

Number	Parameter	Units	Status
none			

Product discipline 0 - Meteorological products, parameter category 1: moisture

Number	Parameter	Units	Status
8	Total precipitation *	kg m-2	Deprecated

8	Total precipitation ***	kg m-2	to Operational
9	Large-scale precipitation (non-convective) *	kg m-2	Deprecated
9	Large-scale precipitation (non-convective) ***	kg m-2	to Operational
10	Convective precipitation *	kg m-2	Deprecated
10	Convective precipitation ***	kg m-2	to Operational
13	Water equivalent of accumulated snow depth *	kg m-2	Deprecated
13	Water equivalent of accumulated snow depth ***	kg m-2	to Operational
14	Convective snow *	kg m-2	Deprecated
14	Convective snow ***	kg m-2	to Operational
15	Large-scale snow *	kg m-2	Deprecated
15	Large-scale snow ***	kg m-2	to Operational
29	Total snowfall *	m	Deprecated
29	Total snowfall ***	m	to Operational

[to Operational] *** Statistical process 1 (Accumulation) doesn't change units. It is recommended to use another parameter with "rate" in its name and accumulation in PDT.

Product discipline 0 - Meteorological products, parameter category 2: momentum

Number	Parameter	Units	Status
none			

Product discipline 0 - Meteorological products, parameter category 3: mass

Number	Parameter	Units	Status
none			

Product discipline 0 - Meteorological products, parameter category 6: cloud

Number	Parameter	Units	Status
3	Low cloud cover *	%	Deprecated
3	Low cloud cover	%	to Operational
4	Medium cloud cover *	%	Deprecated
4	Medium cloud cover	%	to Operational
5	High cloud cover *	%	Deprecated
5	High cloud cover	%	to Operational

Product discipline 0 - Meteorological products, parameter category 7: thermodynamic stability indices

Number	Parameter	Units	Status
none			

Product discipline 0 - Meteorological products, parameter category 15: radar

Number	Parameter	Units	Status
none			

Product discipline 0 - Meteorological products, parameter category 18: nuclear/radiology

Number	Parameter	Units	Status
6	Time-integrated air concentration of caesium pollutant *	Bq s m-3	Deprecated
6	Time-integrated air concentration of caesium pollutant (see Note 1)	Bq s m-3	to Operational

7	Time-integrated air concentration of iodine pollutant *	Bq s m-3	Deprecated
7	<i>Time-integrated air concentration of iodine pollutant (see Note 1)</i>	<i>Bq s m-3</i>	<i>to Operational</i>
8	Time-integrated air concentration of radioactive pollutant *	Bq s m-3	Deprecated
8	<i>Time-integrated air concentration of radioactive pollutant (see Note 1)</i>	<i>Bq s m-3</i>	<i>to Operational</i>

- (1) * Parameter deprecated. See Regulation 92.6.2 and use another parameter instead.
*[to Operational] * Statistical process 1 (Accumulation) doesn't change units. It is recommended to use another parameter without the word "time-integrated" in its name and accumulation in PDT.*

Product discipline 0 - Meteorological products, parameter category 19: physical atmospheric properties

Number	Parameter	Units	Status
none			

Product discipline 0 - Meteorological products, parameter category 20: Atmospheric chemical constituents

Number	Parameter	Units	Status
none			

Product discipline 0 - Meteorological products, parameter category 191: miscellaneous

Number	Parameter	Units	Status
none			

Product discipline 2 - Land surface products, parameter category 0: vegetation/biomass

Number	Parameter	Units	Status
none			

Product discipline 2 - Land surface products, parameter category 3: soil products

Number	Parameter	Units	Status
none			

Product discipline 2 - Land surface products, parameter category 4: Fire weather products

Number	Parameter	Units	Status
none			

Product discipline 3 - Satellite products *, parameter category 0: image format products

Number	Parameter	Units	Status
--------	-----------	-------	--------

*[Validation] * Modify the title to "Satellite remote sensing products".*

Product discipline 3 - Satellite products *, parameter category 1: quantitative products

Number	Parameter	Units	Status
--------	-----------	-------	--------

*[Validation] * Modify the title to "Satellite remote sensing products".*

Product discipline 4 - Space weather products, parameter category 0: temperature

<i>Number</i>	<i>Parameter</i>	<i>Units</i>	<i>Status</i>
<i>0</i>	<i>Temperature</i>	<i>K</i>	<i>Validation</i>
<i>1</i>	<i>Electron temperature</i>	<i>K</i>	<i>Validation</i>
<i>2</i>	<i>Proton temperature</i>	<i>K</i>	<i>Validation</i>
<i>3</i>	<i>Ion temperature</i>	<i>K</i>	<i>Validation</i>
<i>4</i>	<i>Parallel temperature</i>	<i>K</i>	<i>Validation</i>
<i>5</i>	<i>Perpendicular temperature</i>	<i>K</i>	<i>Validation</i>
<i>6-191</i>	<i>Reserved</i>		<i>Validation</i>

192-254	Reserved for local use	Validation
255	Missing	Validation

Product discipline 4 - Space weather products, parameter category 1: momentum

Number	Parameter	Units	Status
0	Velocity magnitude (speed)	m s-1	Validation
1	1st vector component of velocity (coordinate system dependent)	m s-1	Validation
2	2nd vector component of velocity (coordinate system dependent)	m s-1	Validation
3	3rd vector component of velocity (coordinate system dependent)	m s-1	Validation
4-191	Reserved		Validation
192-254	Reserved for local use		Validation
255	Missing		Validation

Product discipline 4 - Space weather products, parameter category 2: charged particle mass and number

Number	Parameter	Units	Status
0	Particle number density	m-3	Validation
1	Electron density	m-3	Validation
2	Proton density	m-3	Validation
3	Ion density	m-3	Validation
4	Vertical electron content	m-2	Validation
5	HF absorption frequency	Hz	Validation
6	HF absorption	dB	Validation
7	Spread F	m	Validation
8	h'F	m	Validation
9	Critical frequency	Hz	Validation
10	Scintillation	Numeric	Validation
11-191	Reserved		Validation
192-254	Reserved for local use		Validation
255	Missing		Validation

Product discipline 4 - Space weather products, parameter category 3: electric and magnetic fields

Number	Parameter	Units	Status
0	Magnetic field magnitude	T	Validation
1	1st vector component of magnetic field	T	Validation
2	2nd vector component of magnetic field	T	Validation
3	3rd vector component of magnetic field	T	Validation
4	Electric field magnitude	V m-1	Validation
5	1st vector component of electric field	V m-1	Validation
6	2nd vector component of electric field	V m-1	Validation
7	3rd vector component of electric field	V m-1	Validation
8-191	Reserved		Validation
192-254	Reserved for local use		Validation
255	Missing		Validation

Product discipline 4 - Space weather products, parameter category 4: energetic particles

Number	Parameter	Units	Status
0	Proton flux (differential)	(m2 s sr eV)-1	Validation

1	Proton flux (integral)	$(m^2 s sr)^{-1}$	Validation
2	Electron flux (differential)	$(m^2 s sr eV)^{-1}$	Validation
3	Electron flux (integral)	$(m^2 s sr)^{-1}$	Validation
4	Heavy ion flux (differential)	$(m^2 s sr eV/nuc)^{-1}$	Validation
5	Heavy ion flux (integral)	$(m^2 s sr)^{-1}$	Validation
6	Cosmic ray neutron flux	h^{-1}	Validation
7-191	Reserved		Validation
192-254	Reserved for local use		Validation
255	Missing		Validation

Product discipline 4 - Space weather products, parameter category 5: waves

Number	Parameter	Units	Status
0-191	Reserved		Validation
192-254	Reserved for local use		Validation
255	Missing		Validation

Product discipline 4 - Space weather products, parameter category 6: solar electromagnetic emissions

Number	Parameter	Units	Status
0	Integrated solar irradiance	$W m^{-2}$	Validation
1	Solar x-ray flux (XRS long)	$W m^{-2}$	Validation
2	Solar x-ray flux (XRS short)	$W m^{-2}$	Validation
3	Solar EUV irradiance	$W m^{-2}$	Validation
4	Solar spectral irradiance	$W m^{-2} nm^{-1}$	Validation
5	F10.7	$W m^{-2} Hz^{-1}$	Validation
6	Solar radio emissions	$W m^{-2} Hz^{-1}$	Validation
7-191	Reserved		Validation
192-254	Reserved for local use		Validation
255	Missing		Validation

Product discipline 4 - Space weather products, parameter category 7: terrestrial electromagnetic emissions

Number	Parameter	Units	Status
0	Limb intensity	$m^{-2} s^{-1}$	Validation
1	Disk intensity	$m^{-2} s^{-1}$	Validation
2	Disk intensity day	$m^{-2} s^{-1}$	Validation
3	Disk intensity night	$m^{-2} s^{-1}$	Validation
4-191	Reserved		Validation
192-254	Reserved for local use		Validation
255	Missing		Validation

Product discipline 4 - Space weather products, parameter category 8: imagery

Number	Parameter	Units	Status
0	X-ray radiance	$W sr^{-1} m^{-2}$	Validation
1	EUV radiance	$W sr^{-1} m^{-2}$	Validation
2	H-alpha radiance	$W sr^{-1} m^{-2}$	Validation
3	White light radiance	$W sr^{-1} m^{-2}$	Validation
4	CaII-K radiance	$W sr^{-1} m^{-2}$	Validation
5	White light coronagraph radiance	$W sr^{-1} m^{-2}$	Validation

6	Heliospheric radiance	W sr-1 m-2	Validation
7	Thematic mask	Numeric	Validation
8-191	Reserved		Validation
192-254	Reserved for local use		Validation
255	Missing		Validation

Product discipline 4 - Space weather products, parameter category 9: ion-neutral coupling

Number	Parameter	Units	Status
0	Pedersen conductivity	S m-1	Validation
1	Hall conductivity	S m-1	Validation
2	Parallel conductivity	S m-1	Validation
3-191	Reserved		Validation
192-254	Reserved for local use		Validation
255	Missing		Validation

Product discipline 10 - Oceanographic products, parameter category 0: waves

46-191	Reserved		Operational
46	2-dim spectral energy density $E(f, \theta)$	m2 s	Validation
47	Frequency spectral energy density $E(f) = \int E(f, \theta) d\theta$	m2 s	Validation
48	Directional spectral energy density $E(\theta) = \int E(f, \theta) df / m0$	-	Validation
49-191	Reserved		Validation

Product discipline 10 - Oceanographic products, parameter category 4: sub-surface properties

Number	Parameter	Units	Status
none			

Code table 4.5 - Fixed surface types and units

Code figure	Meaning	Unit	Status
120-159	Reserved		Operational
120-149	Reserved		Validation
150	Generalized vertical height coordinate (4)		Validation
151-159	Reserved		Validation
167-191	Reserved		Operational
167-169	Reserved		Validation
170	Ionospheric D-region level		Validation
171	Ionospheric E-region level		Validation
172	Ionospheric F1-region level		Validation
173	Ionospheric F2-region level		Validation
174-191	Reserved		Validation

[Validation] (x) Hybrid log-pressure level (Code figure 113) can be defined as:

$$\log(p_i) = a_i \times \log(P_{sfc}) + b_i$$

(i = 1, ..., Nlevels); P_{sfc} = surface pressure ; $\log(p_i)$ = natural logarithm of pressure at level i)

[Validation] (x+1) The definition of a generalized vertical height coordinate implies the absence of coordinate values in Section 4 but the presence of an external 3D-GRIB message that specifies the height of every model grid point in metres (see Notes for Section 4), i.e. this GRIB message will contain the field with discipline = 0, category = 3, parameter = 6 (Geometric height).

Code table 4.10 - Type of statistical processing

Code figure	Meaning	Status
1	Accumulation	Operational
<i>1</i>	<i>Accumulation (see Note 1)</i>	<i>to Operational</i>
7	Covariance (temporal variance)	Operational
<i>7</i>	<i>Covariance (temporal variance) (see Note 2)</i>	<i>to Operational</i>
9	Ratio	Operational
<i>9</i>	<i>Ratio (see Note 3)</i>	<i>to Operational</i>
11-191	Reserved	Operational
<i>11</i>	<i>Summation</i>	<i>to Operational</i>
<i>12-191</i>	<i>Reserved</i>	<i>to Operational</i>

Notes:

[to Operational] (1) The original data value (Y in the note 4 of regulation 92.9.4) has units of Code table 4.2 multiplied by second, unless otherwise noted on Code table 4.2.

[to Operational] (2) The original data value has squared units of Code table 4.2.

[to Operational] (3) The original data value is non-dimensional number without units.

Code table 4.213 - Soil type

Code figure	Meaning	Status
12-191	Reserved	Operational
<i>12</i>	<i>Loam</i>	<i>Validation</i>
<i>13</i>	<i>Peat</i>	<i>Validation</i>
<i>14</i>	<i>Rock</i>	<i>Validation</i>
<i>15</i>	<i>Ice</i>	<i>Validation</i>
<i>16</i>	<i>Water</i>	<i>Validation</i>
<i>17-191</i>	<i>Reserved</i>	<i>Validation</i>

CODE TABLES USED IN SECTION 5

Code table 5.0 - Data representation template number

Code figure	Meaning	Status
42-49	Reserved	Operational
42	Grid point and spectral data - CCSDS szip	Validation
43-49	Reserved	Validation

CODE TABLES USED IN SECTION 6

None