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| WORLD METEOROLOGICAL ORGANIZATION  COMMISSION FOR BASIC SYSTEMS  -----------------------------  FOURTH MEETING OF  INTER-PROGRAMME EXPERT TEAM ON DATA REPRESENTATION MAINTENANCE AND MONITORING  GENEVA, SWITZERLAND, 30 MAY - 3 JUNE 2016 |  | IPET-DRMM-IV / Doc. 2.2 (7)  (18. 5. 2016)  -------------------------  ITEM 2.2  ENGLISH ONLY |

GRIB

**New ensemble templates and one ensemble template correction**

*Submitted by Sibylle Krebber, Dörte Liermann (DWD)*

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**Summary and Purpose of Document**

Existing templates for deterministic forecasts have to be doubled for ensemble forecasts; one template correction (typo).

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**ACTION PROPOSED**

The meeting is requested to review the proposals and recommend the contents for fast-track approval in November 2016 (FT2016-2).

**ANNEXES:**

1. -

**DISCUSSIONS**

DWD encodes forecast products of volcanic ash, mineral dust or other aerosols with product templates 4.40 (chemical constituents), 4.48 (optical properties of aerosol) and 4.57 (chemical constituents based on a distribution function). In the near future these forecasts will also be done in ensemble mode. With template 4.41 the ensemble template is provided for chemical constituents. But the ensemble pendants for the others are missing.

Therefore we ask for the ensemble extension of template 4.48 and 4.57.

Furthermore the typo in template 4.56 for ensemble products of tile parameters has to be corrected. There the information “Type of ensemble forecast” was missing.

**PROPOSAL**

Add in **Table 4.0: Product definition template number**

49 Individual ensemble forecast, control and perturbed, at a horizontal level or in a   
 horizontal layer at a point in time for optical properties of aerosol

50 Reserved

56 Individual ensemble forecast, control and perturbed, at a horizontal level or in a horizontal layer at a point in time for spatio-temporal changing tile parameters (deprecated)

58 Individual ensemble forecast, control and perturbed, at a horizontal level or in a   
 horizontal layer at a point in time for atmospheric chemical constituents based on a distribution function

59 Individual ensemble forecast, control and perturbed, at a horizontal level or in a horizontal layer at a point in time for spatio-temporal changing tile parameters

(corrected version of template 4.56)

Add product definition templates:

***Product definition template 4.49 – individual ensemble forecast, control and perturbed, at a horizontal level or in a horizontal layer at a point in time for optical properties of aerosol***

Octet No. Contents

10 Parameter category (see Code table 4.1)

11 Parameter number (see Code table 4.2)

12–13 Aerosol type (see Common Code table C–14)

14 Type of interval for first and second size (see Code table 4.91)

15 Scale factor of first size

16–19 Scaled value of first size in metres

20 Scale factor of second size

21–24 Scaled value of second size in metres

25 Type of interval for first and second wavelength (see Code table 4.91)

26 Scale factor of first wavelength

27–30 Scaled value of first wavelength in metres

31 Scale factor of second wavelength

32–35 Scaled value of second wavelength in metres

36 Type of generating process (see Code table 4.3)

37 Background generating process identifier (defined by originating centre)

38 Analysis or forecast generating process identifier (defined by originating centre)

39–40 Hours of observational data cut-off after reference time (see Note)

41 Minutes of observational data cut-off after reference time

42 Indicator of unit of time range (see Code table 4.4)

43–46 Forecast time in units defined by octet 42

47 Type of first fixed surface (see Code table 4.5)

48 Scale factor of first fixed surface

49–52 Scaled value of first fixed surface

53 Type of second fixed surface (see Code table 4.5)

54 Scale factor of second fixed surface

55–58 Scaled value of second fixed surface

59 Type of ensemble forecast (see Code table 4.6)

60 Perturbation number

61 Number of forecasts in ensemble

Note: Hours greater than 65534 will be coded as 65534.

***Product definition template 4.58 – individual ensemble forecast, control and perturbed, at a horizontal level or in a horizontal layer at a point in time for atmospheric chemical constituents based on a distribution function***

Octet No. Contents

10 Parameter category (see Code table 4.1)

11 Parameter number (see Code table 4.2)

12–13 Atmospheric chemical constituent type (see Code table 4.230)

14–15 Number of mode (N) of distribution (see Note 2)

16–17 Mode number (l)

18–19 Type of distribution function (see Code table 4.240)

20 Number of following function parameters (Np), defined by type given in octet 18–19 (Type of distribution function)

*Repeat the following 5 octets for the number of function parameters (n = 1,* *Np), if Np > 0*

21+5(n–1) List of scale factor of fixed distribution function parameter (p1–pNp), defined by type of distribution in octet 18–19

(22+5(n–1))–(25+5(n–1)) List of scaled value of fixed distribution function parameter (p1–pNp), defined by type of distribution in octet 18–19

21+5Np Type of generating process (see Code table 4.3)

22+5Np Background generating process identifier (defined by originating centre)

23+5Np Analysis or forecast generating process identifier (defined by originating centre)

(24+5Np)–(25+5Np) Hours of observational data cut-off after reference time (see Note 1)

26+5Np Minutes of observational data cut-off after reference time

27+5Np Indicator of unit of time range (see Code table 4.4)

(28+5Np)–(31+5Np) Forecast time in units defined by the previous octet

32+5Np Type of first fixed surface (see Code table 4.5)

33+5Np Scale factor of first fixed surface

(34+5Np)–(37+5Np) Scaled value of first fixed surface

38+5Np Type of second fixed surface (see Code table 4.5)

39+5Np Scale factor of second fixed surface

(40+5Np)–(43+5Np) Scaled value of second fixed surface

44+5Np Type of ensemble forecast (see Code table 4.6)

45+5Np Perturbation number

46+5Np Number of forecasts in ensemble

Notes:

(1) Hours greater than 65534 will be coded as 65534.

(2) If Number of mode (N) > 1, then between x N fields with mode number l = 1, …, N define the distribution function. x is the number of variable parameters in the distribution function.

(3) For more information, see Attachment III (Distribution functions in GRIB) in Part B of this volume (I.2 – Att.III/GRIB – 1 to 2).

***Product definition template 4.56 – individual ensemble forecast, control and perturbed, at a horizontal level or in a horizontal layer at a point in time for spatio-temporal changing tile parameters***

**Note: This template is deprecated. Template 4.59 should be used instead.**

Octet No. Contents

10 Parameter category (see Code table 4.1)

11 Parameter number (see Code table 4.2)

12 Tile classification (see Code table 4.242)

13 Total number (NT) of tile/attribute pairs (see Notes 2 and 3)

14 Number of used spatial tiles (NUT) (see Notes 2 and 3)

15 Tile index (ITN = {1,…, NUT}) (see Note 2)

16 Number of used tile attributes (NAT) for tile ITN (see Note 2)

17 Attribute of tile (see Code table 4.241)) (A = {A(1),…, A(NAT(ITN))}) (see Note 2)

18 Type of generating process (see Code table 4.3)

19 Background generating process identifier (defined by originating centre)

20 Analysis or forecast generating process identifier (defined by originating centre)

21–22 Hours of observational data cut-off after reference time (see Note 1)

23 Minutes of observational data cut-off after reference time

24 Indicator of unit of time range (see Code table 4.4)

25–28 Forecast time in units defined by octet 24

29 Type of first fixed surface (see Code table 4.5)

30 Scale factor of first fixed surface

31–34 Scaled value of first fixed surface

35 Type of second fixed surface (see Code table 4.5)

36 Scale factor of second fixed surface

37–40 Scaled value of second fixed surface

41 Perturbation number

42 Number of forecasts in ensemble

Notes:

(1) Hours greater than 65534 will be coded as 65534.

(2) See note (2) under product definition template 4.55.

(3) For more information, see Attachment IV (Spatio-temporal changing tiles in GRIB) in Part B of this volume (I.2 – Att.IV/GRIB–1 to 3).

***Product definition template 4.59 – individual ensemble forecast, control and perturbed, at a horizontal level or in a horizontal layer at a point in time for spatio-temporal changing tile parameters***

Octet No. Contents

10 Parameter category (see Code table 4.1)

11 Parameter number (see Code table 4.2)

12 Tile classification (see Code table 4.242)

13 Total number (NT) of tile/attribute pairs (see Notes 2 and 3)

14 Number of used spatial tiles (NUT) (see Notes 2 and 3)

15 Tile index (ITN = {1,…, NUT}) (see Note 2)

16 Number of used tile attributes (NAT) for tile ITN (see Note 2)

17 Attribute of tile (see Code table 4.241)) (A = {A(1),…, A(NAT(ITN))}) (see Note 2)

18 Type of generating process (see Code table 4.3)

19 Background generating process identifier (defined by originating centre)

20 Analysis or forecast generating process identifier (defined by originating centre)

21–22 Hours of observational data cut-off after reference time (see Note 1)

23 Minutes of observational data cut-off after reference time

24 Indicator of unit of time range (see Code table 4.4)

25–28 Forecast time in units defined by octet 24

29 Type of first fixed surface (see Code table 4.5)

30 Scale factor of first fixed surface

31–34 Scaled value of first fixed surface

35 Type of second fixed surface (see Code table 4.5)

36 Scale factor of second fixed surface

37–40 Scaled value of second fixed surface

41 Type of ensemble forecast (see Code table 4.6)

42 Perturbation number

43 Number of forecasts in ensemble

Notes:

(1) Hours greater than 65534 will be coded as 65534.

(2) See note (2) under product definition template 4.55.

(3) For more information, see Attachment IV (Spatio-temporal changing tiles in GRIB) in Part B of this volume (I.2 – Att.IV/GRIB–1 to 3).