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| WORLD METEOROLOGICAL ORGANIZATION  COMMISSION FOR BASIC SYSTEMS  -----------------------------  FIRST MEETING OF  INTER-PROGRAMME EXPERT TEAM ON CODES MAINTENANCE  GENEVA, SWITZERLAND, 24 - 28 JULY 2017 |  | IPET-CM-I / Doc. 2.6 (9)  (12. 7. 2017)  -------------------------  ITEM 2.7  ENGLISH ONLY |

GRIB edition 3

**Template for irregular grid**

*Submitted by Enrico Fucile (ECMWF)*

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**Summary and Purpose of Document**

Template components and template for irregular grid are proposed.

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**ACTION PROPOSED**

The Team is asked to review the proposal and accept it for validation.

**DISCUSSIONS**

An unstructured mesh is completely unstructured and is defined as an ordered list of couples (latitude, longitudes) without any structure. There is also the need of defining a bi-dimensional grid with a couple (latitude, longitude) values associated with a couple of integer coordinates on the grid (i, j ) . In terms of arrays the unstructured mesh can be defined as

( latitude(k), longitude(k) ) with k=1,…,NumberOfPoints

and the irregular grid can be defined as

( latitude(i,j), longitude(j,j) ) with i=1,…,Ni and j=1,…,Nj

In the irregular grid we have the concepts of lines and rows proper of a grid which are not relevant for an unstructured mesh.

**PROPOSAL**

***Horizontal Domain Template Component 4.14 – Latitude/longitude irregular grid simple packing***

|  |  |
| --- | --- |
| Byte No. | Contents |
| 1-2 | Ni - Number of columns (1) |
| 3-4 | Nj - Number of rows (1) |
| 5-12 | Longitude Reference Value. (IEEE 64-bit floating-point) |
| 13-14 | Longitude Binary scale factor |
| 15-16 | Longitude Decimal scale factor |
| 17 | Number of bits used for each longitude value |
| 18-25 | Latitude Reference Value. (IEEE 64-bit floating-point) |
| 26-27 | Latitude Binary scale factor |
| 28-29 | Latitude Decimal scale factor |
| 30 | Number of bits used for each latitude value |
| 31-34 | Nblon - Number of bytes of longitude encoded data |
| 35 – 35+Nblon | Longitude simple packing encoded data |
| 36+Nblon - 37+Nblon | Nblat - Number of bytes of latitude encoded data |
| 38+Nblon – 38+Nblon+Nblat | Latitude simple packing encoded data |

Notes:

(1) unsigned

***Horizontal Domain Template 4.y1 – Latitude/longitude irregular grid on ellipsoidal planet simple packing***

|  |  |
| --- | --- |
| Component Code | Component Name |
| 4.0 | Ellipsoid of revolution defined with axis lengths |
| 4.14 | Latitude/longitude irregular grid simple packing |

***Horizontal Domain Template 4.y2 – Rotated Latitude/longitude irregular grid on ellipsoidal planet simple packing***

|  |  |
| --- | --- |
| Component Code | Component Name |
| 4.0 | Ellipsoid of revolution defined with axis lengths |
| 4.14 | Latitude/longitude irregular grid simple packing |
| 4.2 | Rotation of latitude/longitude coordinate system |