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| WORLD METEOROLOGICAL ORGANIZATIONCOMMISSION FOR BASIC SYSTEMS-----------------------------FIRST MEETING OFINTER-PROGRAMME EXPERT TEAM ONCODES MAINTENANCEGENEVA, SWITZERLAND, 24 - 28 JULY 2017 |  | IPET-CM-I / Doc. 2.4 (5)(20. 7. 2017)-------------------------ITEM 2.4ENGLISH ONLY |

BUFR

**New BUFR sequence for describing satellites contributing to an observed geophysical quantity**

*Submitted by* *Simon Elliott (EUMETSAT), Daniel Lee (EUMETSAT)*

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**Summary and Purpose of Document**

This document proposes a new sequence in BUFR class 4 in order to precisely describe satellite constellations contributing observations to a computed geophysical quantity.

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**ACTION PROPOSED**

The meeting is requested to approve the contents for inclusion within the November 217 fast-track (FT2017-2) update to the WMO Manual on Codes.

**DISCUSSIONS**

Several satellite products (e.g. atmospheric motion vectors, AMVs) are produced by fusing data from multi-satellite constellations. Currently the constellation can be described to users by using special combinatorial entries in Common Code Table C-5 to describe multiple satellites, as shown in Table 1.

Table 1: Current combinatorial entries from Common Code Table C-5.

|  |  |
| --- | --- |
| **Code figure** | **Meaning** |
| 850 | Combination of TERRA and AQUA |
| 851 | Combination of NOAA 16 to NOAA 19 |
| 852 | Combination of Metop-1 to Metop-3 |
| 853 | Combination of METEOSAT and DMSP |
| 854 | Non-specific mixture of geostationary and low Earth-orbiting satellites |

Some applications, however, would profit from receiving not only a summary of the identities of the contributing satellites, but also the specific satellites involved (i.e. Metop-1, -2 and -1 for a triplet constellation, rather than a generic mix of Metop satellites). It is also possible, using the order of the satellites specified, to determine the reference image used e.g. in AMVs. As the reference image has the largest contribution to the quality of a given product, the platform on which it was collected can be of relevance, especially as some satellites have long mission lifetimes and thus be subject to sensor degradation for longer periods of time. For example, products might be derived from observations made on board Metop-A, which was launched in 2006, and on Metop-C, which is planned for launch in 2018. Another important fact might be the number of satellites contributing. The fusion of data from multiple missions and orbits muddies the waters further, so that a more general approach is needed.

Listing every possible permutation of contributing satellite would quickly overfill Common Code Table C-5 and be unnecessarily complicated. Therefore, in order to provide this information to users, a mechanism is needed which exposes the specific satellites which contributed to the computation of a given product, as well as their order, to users.

**PROPOSAL**

Add the following sequence “Satellites contributing observations to computed geophysical quantity” to BUFR Table D/04:

|  |  |  |  |
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| TABLE REFERENCE | TABLE REFERENCES | ELEMENT NAME | ELEMENT DESCRIPTION |
| F XY Y |
| 3 04 038 | 1 04 000 | Delayed replication of 4 descriptors |  |
|  | 0 31 000 | Delayed descriptor replication factor |  |
|  | 0 01 007 | Satellite identifier |  |
|  | 0 02 019 | Satellite instruments |  |
|  | 3 01 011 | Year, month, day |  |
|  | 3 01 013 | Hour, minute, second |  |