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| WORLD METEOROLOGICAL ORGANIZATION  COMMISSION FOR BASIC SYSTEMS  -----------------------------  SECOND MEETING OF  INTER-PROGRAMME EXPERT TEAM ON CODES MAINTENANCE  OFFENBACH, GERMANY, 28 MAY - 1 JUNE 2018 |  | IPET-CM-II / Doc. 2.2(3)  27.04.2018  -------------------------  ITEM 2.2  ENGLISH ONLY |

MANUAL ON CODES: TABLE-DRIVEN CODE FORMS

FM 92 GRIB

New entry in GRIB2 Code Table 4.9

*Submitted by Jeff Ator (USA)*

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**Summary and Purpose of Document**

This document proposes a new entry in GRIB2 code table 4.9 to be used in reporting the probability of discrete events.

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**ACTION PROPOSED**

The team is requested to consider the proposal for possible inclusion in November 2018 fast-track (FT2018-2).

**DISCUSSION AND PROPOSAL**

The current entries within GRIB2 code table 4.9 are as follows:

**Code table 4.9** – *Probability type*

Code figure Meaning

0 Probability of event below lower limit

1 Probability of event above upper limit

2 Probability of event between lower and upper limits (the range includes the lower limit   
 but not the upper limit)

3 Probability of event above lower limit

4 Probability of event below upper limit

5–191 Reserved

192–254 Reserved for local use

255 Missing

This allows one to easily report the probability that, e.g. the dew point temperature is >= 283.5 K and < 290.2 K at each successive grid point, by using PDT 4.5 (or 4.9) with octet #10 set to 0, octet #11 set to 6, octet #37 (i.e. the CT 4.9 value) set to 2, and octets #38-42 and #43-47 set, respectively, to indicate the values 283.5 and 290.2

But what if one wanted to report the probability of an event denoted by a discrete code table entry in code table 4.2, say, the probability of a dry thunderstorm occurring at each successive grid point.  You could similarly use PDT 4.5 (or 4.9) with octet #10 set to 19, octet #11 set to 25 (=”Weather”), and octets #38-42 and #43-47 both set to 217 (=”Dry thunderstorm”, from CT 4.225).  But the problem is that there’s no value defined in CT 4.9 which we could use in octet #37 to say that we’re talking about the probability of the value being exactly equal to either the lower or upper limits in octets #38-47, or that they’re the same, so this means we can’t use PDT 4.5, PDT 4.9, etc. to report probability values for any parameter whose units are discrete code table entries. This could potentially be resolved by adding a new entry to CT 4.9 as follows:

5 Probability of event equal to lower and upper limit (the lower and upper limits are identical)

or even (if preferred):

5 Probability of event equal to lower limit

and just leave the upper limit octets missing when using one of these templates.

This topic came up in a discussion with a U.S. GRIB2 user as a potentially useful future update to CT 4.9.  In this case, the user was under a time crunch and decided to go ahead with a local entry for his new product instead of waiting for WMO approval of a new standard CT 4.9 entry; however, if the IPET-CM likes this idea we could consider to add it for future (e.g. November 2018 FT2018-2) fast track for other potential future users, perhaps as a low-risk candidate case for “validation by acclamation”.