

Note on GOES 13-15 MAGPD Data Re-Release

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In order to mitigate two problems with the real-time processing of the GOES 13-15 Magnetospheric Particle Detector (MAGPD), NOAA NCEI is re-releasing the MAGPD data files (representing the real-time processing, which started in 2011) with the following changes:

Factor-of-2 Correction Applied to MP4 and MP5 Rates and Fluxes:

The count rates and fluxes in the two highest energy channels (MP4, 250-350 (300) keV, and MP5, 350-800 (575) keV) are a factor of 2 too large due to an error in the conversion from counts to count rates. This situation holds with the full-resolution rates and fluxes as well as 1-min and 5-min averages. Therefore, we are dividing the MP4 and MP5 rates and fluxes by 2 prior to release. In order to indicate this correction, the quality flags are set to '2'.

Contamination-Corrected Fluxes Withheld:

The electron contamination correction described in section 5.12 of http://www.ngdc.noaa.gov/stp/satellite/goes/doc/goes_nop/GOESN-ENG-048_RevD_EPS_HEPAD_13May2011.pdf tends to over-correct the MAGPD proton fluxes. This situation holds with the 1-min and 5-min averages, particularly in the three highest energy channels. Therefore, we are omitting the contamination-corrected fluxes from the files containing the 1-minute averages. Since the 5-minute files only contain contamination-corrected fluxes, we will not re-release them.

Note: Prior to 2011, the MAGPD raw counts were not converted to fluxes in real-time. These data have been processed off-line and released, including the factor-of-2 correction described above and with the contamination-corrected fluxes withheld. The quality flags in the pre-2011 MAGPD files do not have the quality flag set to '2' to indicate the proper conversion from counts to rates, although it is correct.

Possible Degradation due to Radiation Damage

Comparisons with GOES-16 and -17 proton flux measurements in the same energy range during 2017 and 2018 indicate that MAGPD fluxes are significantly low. The MAGPD telescopes have a similar design to the MEPED proton telescopes flown on the low-earth-orbiting POES and Metop satellites. Since the MEPED proton telescopes are known to suffer from radiation damage on-orbit, it is likely that the MAGPD telescopes also suffer from the same problem. The result is to shift the effective channel energies upwards. MAGPD fluxes should therefore be used with caution.

If you have questions about the MAGPD data, please contact Juan Rodriguez (juan.rodriquez@noaa.gov).