

# IMP-8 DATA CAVEATS

## Charged Particle Measurements Experiment [CPME]

[1.] As reported in Tylka, A.J., Dietrich, W.F., and Boberg, P.R. (2007), incomplete correction for dead-time may have affected the CPME instrument. Dead-time arises primarily from the active anti-coincidence shield and results in an underestimation of protons.

Tylka, A. J., Dietrich, W. F., and Boberg, P. R., “Probability Distributions of High-Energy Solar-Heavy-Ions Fluxes from IMP-8: 1973-1996,” *IEEE Transactions on Nuclear Science*, Vol. 44, No. 6, 1997, pp. 2140–2149

[2.] As reported in the online “IMP-8 MERGE Manuel” file at [http://sd-www.jhuapl.edu/IMP/cpme\\_docs/merge\\_manual.pdf](http://sd-www.jhuapl.edu/IMP/cpme_docs/merge_manual.pdf) “CPME channels P1-P3 occasionally record false counts due to pulse pileup of high energy electrons. In general, the effect is only significant during periods of high electron flux (typically, during the onset of robust particle flare events). The effect can be detected by observing the behavior of the CPME electron channel E4 (item #54): channels P1-P3 will show a burst-like rise simultaneous with E4. It is not known at this time whether the effect occurs during magnetopause crossings or during other burst-like phenomena.” [PRB]

[3.] As reported in the online “IMP-8 MERGE Manuel” file at [http://sd-www.jhuapl.edu/IMP/cpme\\_docs/merge\\_manual.pdf](http://sd-www.jhuapl.edu/IMP/cpme_docs/merge_manual.pdf) “CPME channel P10 does not seem to be recording counts from the 96-145 MeV/nuc energy range; this may be due to a failure or miscalibration of the channel logic onboard IMP-8. Studies of the kinetic energy spectra using the CPME proton channels suggest that channel P10 may measuring particles in the range covered by channel P8 (item #40).” [PRB] Fig. 1 shows this effect for the 24 September 2001 event. Its evolution resembles that of the 25-48 MeV and 15-25 MeV channels.

[4.] As reported in the online “IMP-8 MERGE Manuel” file at [http://sd-www.jhuapl.edu/IMP/cpme\\_docs/merge\\_manual.pdf](http://sd-www.jhuapl.edu/IMP/cpme_docs/merge_manual.pdf) in early 1978 ... “CPME channel M (M scintillator) underwent a catastrophic change during the series of very large solar particle events in early 1978.” [PRB]

PRB = P.R. Briggs

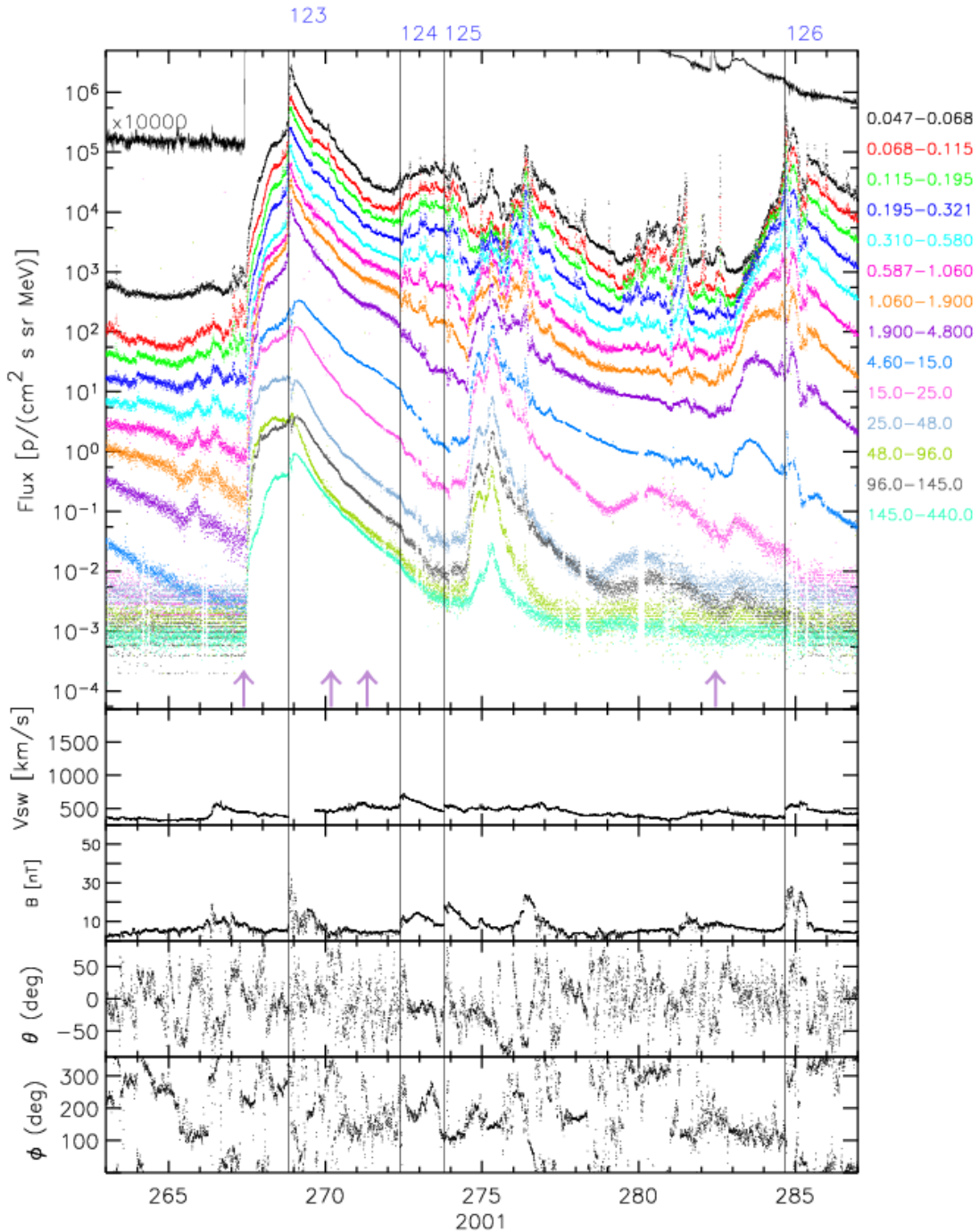


Figure 1. Proton flux observations illustrating contamination of CPME proton channel P10 (96-145 MeV) for the 24 September 2001 event. The first eight flux profiles (black to purple) correspond to ACE/EPAM data. The following flux profiles correspond to IMP-8/CPME., where the grey line clearly shows the channel that is not working well. Courtesy of SEPTEM.

## Goddard Medium Energy (GME)

[1.] As reported on the online “Welcome to the Home Page of the IMP-8 Goddard Medium Energy (GME) Experiment”,

[ [http://spdf.gsfc.nasa.gov/imp8\\_GME/GME\\_home.html](http://spdf.gsfc.nasa.gov/imp8_GME/GME_home.html) ], “The quality of the IMP-8 GME data in terms of particle and energy resolution, and sensitivity, for galactic cosmic ray Hydrogen (2-230 MeV) and Helium (2-450 MeV/nuc) remains comparable to that of any other cosmic ray experiment flown since 1971”.

[2.] As reported by Mike Xapsos (private communication), proton channel P15 [18.70-22.5 MeV] was not used due to an overlap with proton channel P16 (see Fig. 2) and the fact that the proton spectra without this channel made no effect on the smoothness.

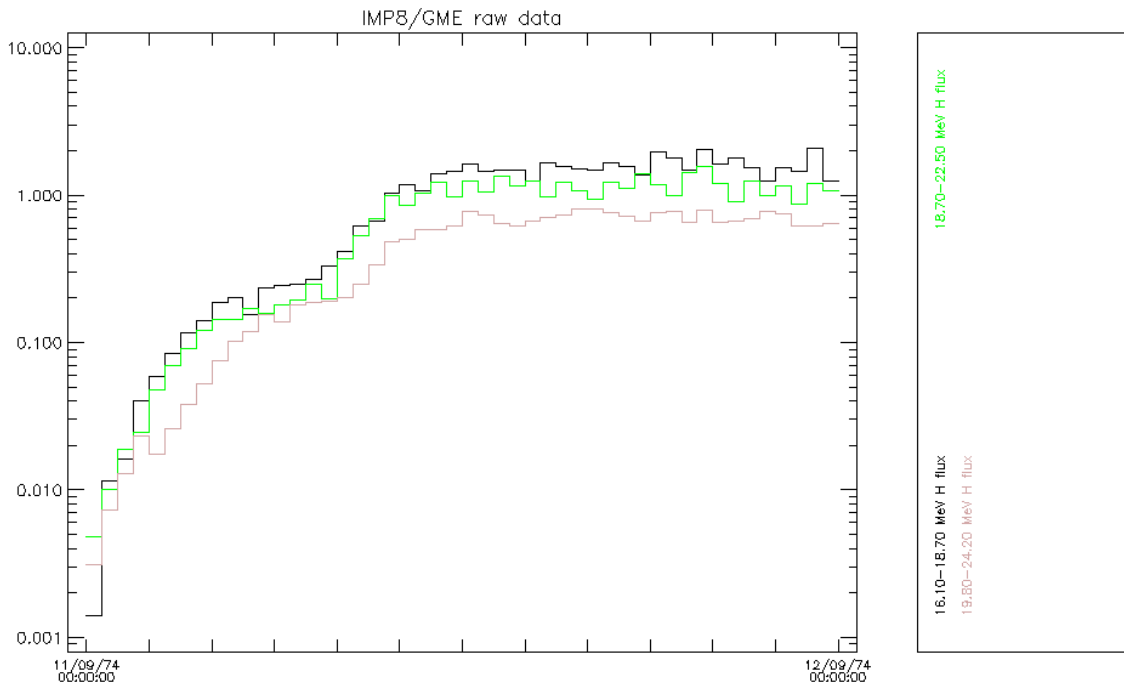


Figure 2. Example of how IMP8/GME ) proton channel P15 [18.70-22.5 MeV] overlaps with proton channel P16.