Fourth Working Meeting on the Harmonization of SEP Data Calibrations

Space Weather Workshop

April 25, 2016

Broomfield, Colorado

Welcome

- Three prior working meetings
  - April 2014 in Boulder (Space Weather Workshop)
  - November 2014 in Liège, Belgium (European Space Weather Week (ESWW) 11)
  - November 2015 in Leuven and Oostende, Belgium (ESWW12)
- Today's goals:
  - Report progress on cross-calibration efforts (7 contributed talks)
  - Discuss guidelines for on-orbit cross-calibration of SEP measurements
    - Address 10 questions listed in report on first working meeting published in *Space Weather* (Rodriguez, J. V., T. G. Onsager, D. Heynderickx, and P. T. A. Jiggens (2014), Meeting Report: Solar Energetic Particle Measurements Intercalibration Workshop, 11 April 2014, Boulder, Colorado, Space Weather, 12, 613–615, doi:10.1002/2014SW001134)

Agenda (1-5 PM)

Title	**Presenter**
Welcome	Juan Rodriguez
The SEPEM Reference Data Set (RDS) – Version 2.0	Piers Jiggens & Daniel Heynderickx
Using the Ionosphere as a Standardized Measure for Cross-Calibration of Energetic Protons	Donald Danskin
Cross-Calibration Procedures in AE9/AP9/SPM	Shawn Young
The Global Positioning System as a Space Weather Monitor	John Sullivan
GOES-R SEP Cross-Calibration Plans	Brian Kress
Cross-Comparisons of GOES HEPAD Solar Proton Fluxes	Juan Rodriguez
Break	--
Open Discussion of Cross-Calibration Guidelines	Led by Juan Rodriguez

Cross-Calibration Guideline Discussion

- One outcome of the discussions at the first working meeting (April 2014) was a recommendation to draft a set of guidelines for the on-orbit cross comparison of solar energetic particle measurements
  - Similar to the first optical calibration guidelines developed for the Global Space-based Inter-Calibration System(GSICS) of the World Meteorological Organization (WMO) and the Coordination Group for Meteorological Satellites.
- This is a ‘grass-roots’ effort – no organization is directing it.
- We will be taking notes and will circulate minutes for participants’ approval.
- Our hope is that these notes will be the start of the cross-calibration guidelines.

Questions 1-5

1. How do different users benefit from a cross-comparison activity?
2. Should there be accuracy objectives for different quantities such as flux and dose?
3. Should there be a standard set of differential energy channels to which measurements are reduced for cross-comparison purposes?
4. Should there be a single standard set of integral channels? If not, should different sets be recommended for different applications (hazards)?
5. What should the set of reference measurements be as a function of time and energy? How can existing long-baseline comparisons be extended into the future?

Questions 6-10

6. What are the proper conditions for cross comparisons that minimize effects such as interplanetary anisotropies and geomagnetic cutoffs?
7. Should methods be recommended for correcting for backgrounds due to penetrating radiation?
8. Should a set of algorithms be recommended for the rapid cross comparison and transformation of data in accordance with these guidelines?
9. What is the minimum set of documentation on instrument performance that should be made public?
10. What should be the process for distributing reprocessed intercalibrated data?