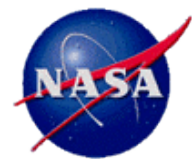


RBSP Coordinated Data Products and Cross-Calibration Activities: An EFW-Centric Perspective

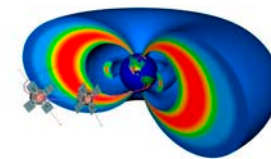
RBSP

Radiation Belt Storm Probes

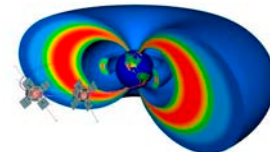
**Dr. John W. Bonnell
RBSP-EFW Hardware Co-I and SOC Lead
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University of California, Berkeley
510-642-0852
jbonnell@ssl.berkeley.edu**



Cross-Cal and Coordinated Data Products

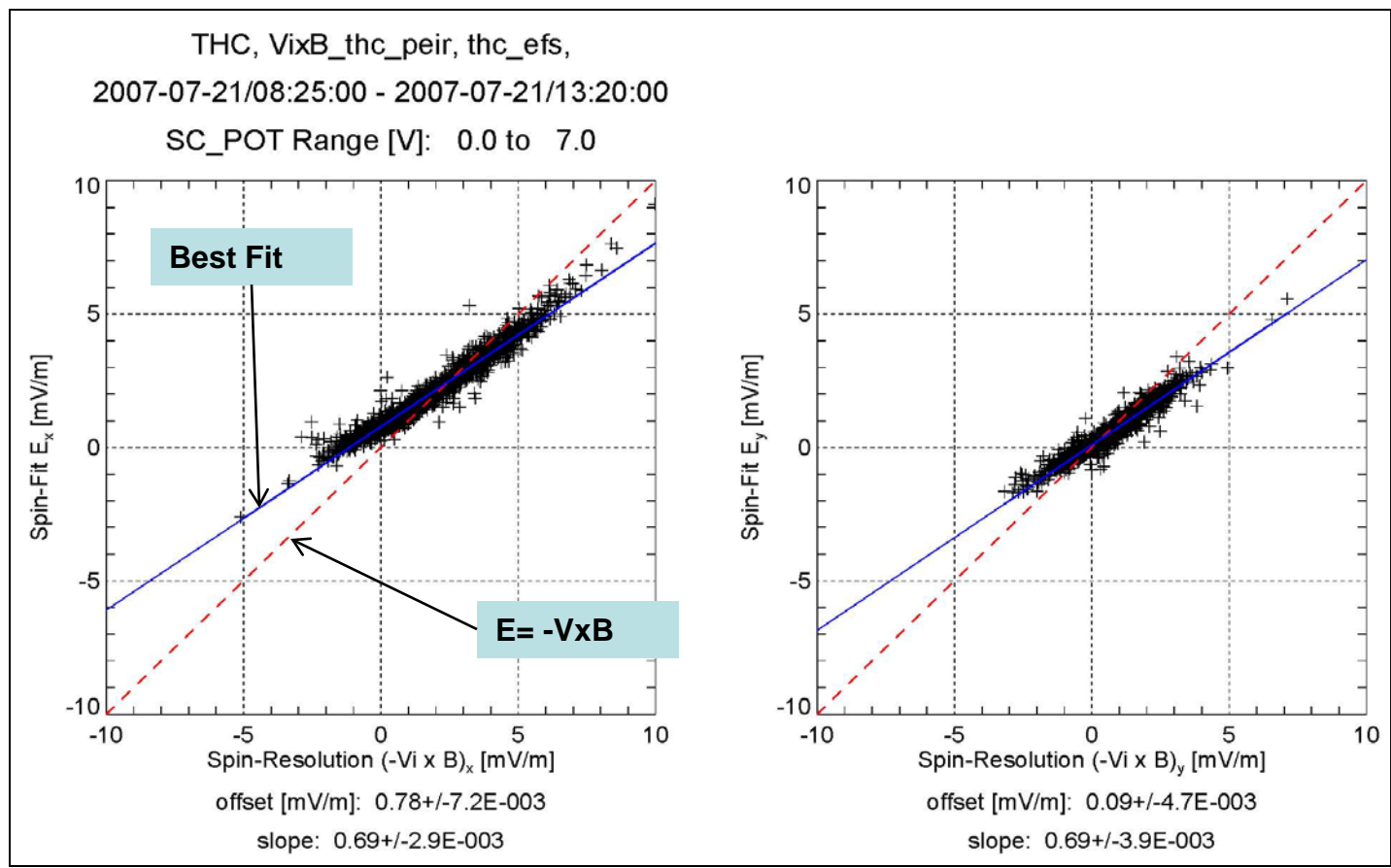


- **Ground Instrument- and Observatory-level calibration activities are complete for fields instruments (EFW and EMFISIS):**
 - Instrument level calibration as well as joint Observatory-level EFW and EMFISIS fields calibrations (Limited and Comprehensive Interface Tests; LIT and CIT) completed (Jan 2011, Jul 2012, Jan 2012).
 - Nominal calibration data already available for L1→L2 processing, and more precise gain and phase calibrations and models being incorporated into L1→L2 processing now.
- **On-orbit calibration activities for EFW:**
 - Cross-calibration of DC E-field with plasma and B-field measurements to determine effective antenna lengths from $E = -V \times B$ (EMF-MAG, and either ECT-HOPE V_{ion} or ephemerides $V_{orbital}$) [EFW, EMFISIS, HOPE]
 - Cross-calibration of spacecraft potential (V_{sc}) with plasma measurements [EFW, HOPE]:
 - $N(V_{sc})$ and corrections to HOPE ion and electron moments due to V_{sc} (as needed).
 - Confirmation of cross-cal of EMFISIS and EFW waveform and spectral data products [EFW, EMFISIS].



Example: E vs. $-V \times B$ (THEMIS EFI/FGM/ESA Inter-Calibration)

RBS
Radiation Belt Storm Probes

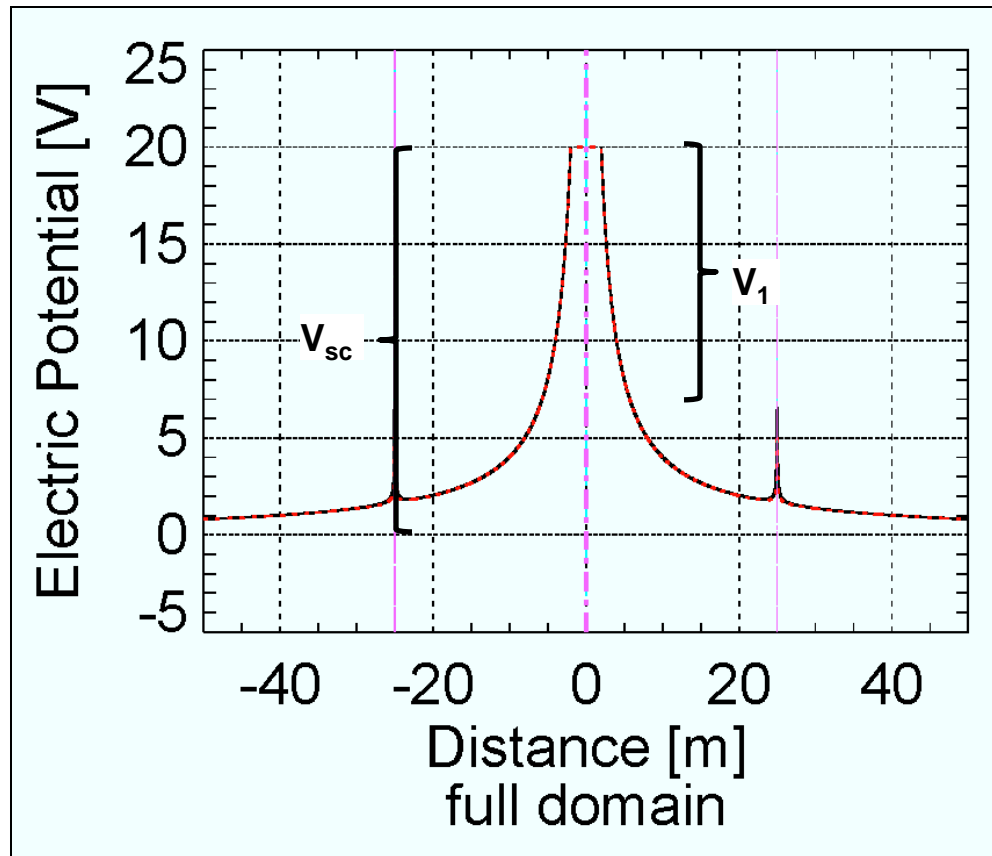
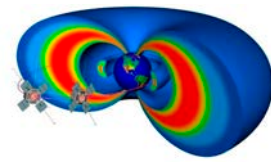


Sunward/Anti-Sunward

Dawn/Dusk



Example:
 V_{sc} vs. V_n (sensor to SC ground)

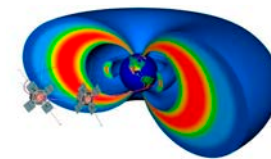


$$V_{sc} = \text{SCALE} * V_1 + \text{OFFSET}$$

efi_potential_cartoon_themis_actual_001.png



Cross-Cal and Coordinated Data Products



Coordinated Data Products – “Ask not what the instrument teams can do for you, but what you can do for the instrument teams.”

- **Well-Documented time tagging conventions:**
 - Different instrument teams will have different conventions for time-tagging their data:
 - Sample time of waveform fields data.
 - Defined time of spin- and multi-spin cadence particle data and fields spectral data (start, end, or middle of interval?).
 - Contacts/Schedule of Work: TBD.
- **Combined ULF E- and B-field spectra, suitable for use in summary plots or scientific work (a useful L3 fields product):**
 - Derived from EFW L2 DC E-field data, EMF-MAG L2 B-field data and support from observational and modeling community on relevant coordinate systems and resolutions.
 - Contacts: EFW, EMFISIS, SWG Members (Takahashi, Elkington, ???).
 - Schedule of Work: post-deploy and commissioning.