IMPACT Status and Data Updates

SWG Meudon, April 21-22, 2008
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Peter Schroeder, and Chris Russell
for the IMPACT team
IMPACT Instrument Status

- SWEA bias voltage has been changed to reduce low energy electron contributions from unanticipated spacecraft-related secondaries (now sweeps from 8 to 2000eV instead of 1 to 2000 eV)
- SWEA/STE-D experience occasional shutdowns, two of three cases clearly associated with energetic particles. D. Curtis is investigating software to monitor such shutdowns and trigger resets.
- MAG offsets slowly drifting but manageable
- SEP instruments (SEPT, LET, SIT, HET) operating nominally
Current IMPACT-led Science Projects (partial list)

- Gosling, Eriksson et al. Solar Wind Reconnection events
- Huttunen et al. multispacecraft ICMEs, small ejecta in slow wind
- Li et al. Solar signatures of STEREO ICMEs
- Liu et al. Flux rope fits to ICMEs; Slow solar wind distortions of ICMEs
- Wang and Lin, ENAs from the heliosheath/termination shock seen by STE; solar electron events
- Jian et al., SIR and ICME event surveys, Mirror mode in solar wind
- Russell et al., Dust Events, solar wind heating
- X. Blanco-Cano, IP shocks and foreshocks
- Odstrcil et al. MHD solar wind models, Cone models of STEREO ICMEs
- Riley et al. MHD corona/solar wind model including website
- Leske et al., CIR events
- Mewaldt et al. SEP events so far
- Cohen et al., multispacecraft SEP events
- Wiedenbeck et al., He 3 and Fe rich events
- Mueller-Mellin et al., Earth Foreshock events, CIR events, multispacecraft events
- Gomez et al. CIR events
- Bucik et al., Small SEP events
- Mason et al., CIR events, small SEP events
- Desai et al. Foreshock ion events
- Lassen et al., magnetospheric events
- Korth et al., Composition of CIR events, suprathermal seed particles
- Ruan et al., Solar Wind Reconnection events
- Sauvaud et al., magnetospheric electron observations/events
- Lauvraud, Opitz et al., Reconnection events, boundary layers, electron halo angular distributions
- Luhmann et al., Solar wind source mapping, planetary (w/VEX.MEX) ICME impacts
## Current IMPACT Level 1 Data Holdings

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(note: command log now online at stereo.ssl.berkeley.edu)
## IMPACT website/data access@UCB

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IMPACT website/data
access@UCB
Coming soon

- HET 1 min Level 1 data in cdf
- “Level 2” merged Key Parameters (1 min) including MAG, PLASTIC Moments, SWEA and LET data in ascii
- “Level 3” Event lists (Shocks, SIRs, ICMEs…)
- Improved boom browse plots with added SWEA electron heat flux pitch angle spectrograms and burst mode intervals identified, plus SEP browse plots
- New Burst mode triggers (see Peter for more detailed information)
- CDAW-served IMPACT MAG, SWEA and LET Level 1 files (Now being tested on their data server-not public yet. This will allow CDAWWeb plotting with other non-STEREO CDAWWeb data, plus ascii downloads).
Magnetometer Data Updates

• In-flight Calibration
  • Compared STEREO A and B against Earth’s field and renormalized gain and orthogonality of sensors
  • Determined offset in least sensitive gain state
  • Added flag to output files indicating gain state

• Stepping Correction (with H.K. Leinweber)
  • Developed a correction algorithm for STEREO A sensor 1 that exhibited quasi-random stepping behavior (magnetic domain stepping or ADC error or ?)
  • Coded and installed correction algorithm in production code
  • Added flag indicating when correction algorithm is used
Example of interferences and corrected STEREO A data.
We use 13 different base lines.
Algorithm

- Detects and removes Interferences that are 0.2 nT to 0.8 nT lower than baselines and less than 16 sec long.
- Starts with fastest baseline and works towards slowest baseline.
- The actual detection is done using a large set of criteria so that natural shapes of the field are preserved as much as possible.
Levels and Slopes

Levels are shifted up to baseline

Slopes are removed
Example of interferences and corrected STEREO A data.
Recent Progress, continued

• Reprocessing
  • New production code finalized and tested on both STEREO A and B data
  • All STEREO A and B data rerun from launch to March 31, 2008
  • We consider these data definitive and final
  • These are the archival data set

• Website
  • Working on all reported bugs
  • New data should now be available on website (through March)
  • Faster web server being installed