Radiation Environment & Glitch Rates on Ge:Ga detectors

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Content

Summary of analyzed observations
Radiation Environment
Selected spikes on Ge:Ga raw ramps
Glitch rate evolution during the mission
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Calibration Observations

- The source of the “rotating” raw Ge:Ga detector data are the spectroscopy orbit prologue measurements: PacSEng_Spec_spu_setup_wait_reset (typically >2700sec)
- Proposals: PvSpecSetup and RpSpecSetup

Herschel Radiation Environment

Herschel SREM data smoothed to 1 hour

Radiation Environment - Comparison with SOHO

SREM TC3 smoothed to 1h

1h sampling

SOHO proton channels:
1.97 MeV
4.71 MeV
16.9 MeV

Radiation Environment - Comparison with SOHO

SREM TC3 smoothed to 1h

1h sampling

SOHO proton channel:
36.4 MeV
Radiation Environment – FFT

FFT of SREM (counter channel: S34 (50% ODs used))

-360° = rotation of the sun

Due to semi-regular DTCP attitudes? (at least SAA shows consistent periodicity)

The Solar Event on 14-Aug-2010

The Solar Event on 14-Aug-2010

Selected spikes on Blue Ge:Ga raw ramps

Selected spikes on Red Ge:Ga raw ramps

Ge:Ga glitch rate evolution during the mission

Ge:Ga and SREM counters show a consistent decrease by ~15-20% starting from about OD240

No data taken during solar events
Ge:Ga glitch rate during the 14-Aug-10 solar event

Analysis by Roland Vavrek:
Extracted from RP Briefing Note 18-Aug-2010
Standard pipeline glitch mask is used here for counting
SREM and Ge:Ga show consistent increase.

Conclusions and open issues

• The relative variation of radiation hit rates on PACS Ge:Ga detectors is quite similar and consistent to the SREM TC1 and TC3 counters.
• Only few significant (but still modest) solar events seen by Herschel so far...
  .... it could have come worse
• Continue analysis of rotating raw channels in spec prologues
• No analysis yet of single raw channels from all observations