HEXTE Science Operations

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Summary:

- Analysis Software (Ftools) and Calibration Products (FITS files)
- SOC monitoring software
- SOC commanding and RXTE User defaults for Cycle 3

WWW page: http://mamacass.ucsd.edu:8080/hexte/hexte.html

HEXTE Data Analysis Software

Released in Ftools 4.0:

- HXTBACK - separates on- and off-source data in Event and Standard Modes.
- HXTDEADPHA, HXTDEADLC - applies dead-time correction to Event data.
- HXTARF - applies average collimator response to HEXTE spectra.
- XTECOL - applies collimator response to HEXTE & PCA light curves.

Delivered to the RXTE GOF for testing:

- HXTDEAD - now with Cluster A&B calibration files, CALDB support. Handles Standard Modes data, deals “rationally” with data gaps.
- HXTARF - full CALDB support. Ready for new collimator responses and ARFs.
- HXTLCURV - background-subtracted light curves for 16-s rocking data.

Under development at UCSD (D. Gruber, P. Blanco, T. Gasaway):

- Support of “non-standard” user configurations (Spectral Bin, Multiscalar Bin).
- scripts for bulk processing, e.g. detector-by-detector analysis, generating responses.
- general sub-rocking interval background subtraction.

HEXTE Calibration Products

- Response matrix: Version of 1997 March 10 with Crab corrections (`hexte_97mar20c_pw*.rmf`) still valid for all HEXTE observations (even after high voltage increase in 1997 January) - for use with XSPEC 10.0 and Ftools 4.0.
- Collimator response: new “fov” files to be delivered to CALDB shortly, for use with HXTARF.
- Effective Area: will be revised on completion of collimator response calibration: updated for (i) for internal HEXTE detector/detector and cluster A /cluster B normalization, and (ii) for HEXTE/PCA/other mission cross-calibration.
- Smaller matrix for “average” HEXTE cluster delivered for proposal simulations.
- Dead-time: Calibrations complete for all HEXTE XULD settings used in guest observations - calibration files delivered to CALDB for use with next RXTE Ftools release of HXTDEAD.
- HEXTE Ftools “cookbook” recipe delivered to GOF.
- Some HEXTE items to be added to XTE standard products filter file, TBD.

HEXTE SOC Monitoring

- Added functionality to HEXTE SOC displays per Duty Scientist requests:

  dials for scaling, log plots, background subtracted spectra, extended interval light curves (> 1 orbit).

- Added server extension for remote Guest Observer displays.

- Fixes to HEXTE Mission Monitoring (D. Gruber and V. Savkoor) have greatly reduced error messages - moving towards automated SOC operations.

- W. Heindl is preparing inputs to MOC for critical health & safety monitoring with APOCC system.

HEXTE Commanding Issues

SOC commanding:

- 1997 April 11 - removed `IDLE/RESUME` commands from *in_occult* and *out_occult* macros which were causing commanding collisions....the HEXTE now remains on during earth-occults, with a corresponding increase in telemetry and dataset sizes. UCSD software installed to check for further incidences of such collisions post facto.

RXTE Cycle 3 HEXTE “DEFAULT” settings - currently under review:

- Lower Energy Bound (LLD) - change from 12 keV to 10 keV?

  + increases count rates for soft sources, useful for timing analyses

  + removes LLD cutoff profile from channels 15-18, increasing HEXTE/PCA overlap

  - increases telemetry 5-10%, some bright sources will require custom configuration.

  - may not be possible to calibrate spectral response accurately below 15 keV.

- Source/background dwell cycle - change from 16s to 32s?

  + may extend the life of the rocking mechanism.

  + gives small increase in off-source observing efficiency (87.5% vs. 75%).

  - has not been verified that background subtraction systematics are negligible.

  - requires longer synchronization time at start of observation.

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