Complete List of Enhancements - v6.0 (Software and Data Products)

May 2010

1. Released new processing tools for VC->L0 and L0->L1 processing. New features include:
    a. relaxed consistency checks for frame vs. packet timestamps, to support deep-space
    operations for outer probes
    b. support for new FFF (survey FFT) data type
    c. added solar wind mode flags to L1 SST and L1 MOM CDFs
    d. where available, enhanced eclipse spin model processing incorporating FGM data
2. tplot_gui has been modified to support x/y/zstacklabels.
3. A "raw" checkbox has been added to the THEMIS GUI load panel to allow the loading of uncalibrated THEMIS data.

June - July 2010

1. Implemented patch to L0->L1 processing to eliminate double-correction of DFB internal delays for FBK and FFT data types.
2. Enhanced the TDAS spinmodel_get_info routine to improve detection of shadow time intervals - now uses the eclipse flag from the BAU telemetry. This has been added to L1 STATE CDFs in the last reprocessing. *Note - this eliminates the need for checking eclipse geometry due to telemetry gaps being mistaken for eclipses.*
3. The following on-board moments calibrations modifications were made:
    a. ESA on-board moment calibrations were updated for normal operation, so results will be consistent with ground moments.
    b. ESA on-board moment calibrations were updated to apply new calibrations when instrument is in solar wind mode.
    c. EFLUX units were modified for SST and ESA on-board moments to be consistent with ground moments. Previous units were eV/cm3 * km/s, new units are eV/cm2/sec
    Corrections will be applied automatically if the TDAS software is updated and L1 moment data is loaded.

    Note - #3a corrections will be applied even if software is not updated.

4. New software has been added to TDAS to allow calibration of SST full/burst distribution data using text files. Software can be activated by setting the /sst_cal keyword when calling the moment or angular spectra routines. Calibration files are stored in the themisdata/th?/l1/sst/0000/ directory. Calibrations can vary with time. Calibration parameters follow:
    a. 4-energy scales(one for each sensor head)
    b. 4-energy offsets(one for each sensor head)
    c. 1-nominal/theoretical geometric factor
    d. 4-gfactor corrections(one for each sensor head)
    e. 1-dead time correction
    f. 4-attenuator corrections(one for each sensor head)
    g. 4x16 efficiency corrections(one for each sensor head and energy bin combination)
Note - *New calibration parameters are not yet available*. But end users can construct their own calibration files.

5. A new beta version of 2-D Slices for both GUI and Command Line (CL) is available. At the CL prompt enter thm_ui_slice2d to use. The new beta version has numerous new plotting options for velocity slices. Also an updated crib sheet for CL (thm_crib_part_slice2d.pro) is now available.
6. Full resolution all-sky imager data processed and available until January 31, 2010.
7. The L2 data for ESA, FGM, FIT, SCM, MOM have been reprocessed to add solar wind mode flags, new FGM calibrations and new formats for time variables.

August - October 2010

1. New calibration coefficients for SST on-board moments have been added. They now match ground computed moments within a few per cent.
2. Corrected ordering the output angle bins when angle="theta" was selected in thm_part_moments and thm_part_getspec.
3. The spin model code has been vectorized and should make load/calibration routines much faster.
4. Added a correction to eliminate spikes in ground psif/psef data when attenuator switches.

5. Added keywords to calc routine/mini language to perform automatic interpolation. Allows user to select interpolation target or will auto-select based on syntax.
6. Formatting of numbers with low precisions and small magnitudes in format_annotation/slice_2d has been fixed.
7. Artemis spin axes offsets updated.
8. Fixed thm_spinfit, so that it is now possible to directly compare on-board spinfit EFS and FGS data with EFF and FGL that have been spin fit on the ground.
9. Upgraded the FIT calibration routine to account for the possibility that EFS data is spin-fit using e34, instead of e12.
10. Added the ability to load EFI data in physical units without spin-dependent offsets.
11. L2 FGM data were reprocessed from 2010-03-29 for new calibration data.
12. The Themis fine attitude determination for probes A, D and E has been updated until 2010, Jul 26.
13. V03 STATE 2010 data cdf's have been reprocessed for inner probes A, D, and E with latest spin attitude corrections.
14. ESA, SST and MOM L1 and L2 cdf's had the following updates:
    a. fixed incorrect ESA solar wind mode flags and time tags
    b. added variables with full 16-bit ESA and SST mode configuration words
15. L2 FBK and FFT cdf's were reprocessed due to the timing changes for the L1 FBK and FFT data.

November - December 2010

1. Added code to remove ESA background from penetrating electrons and ions.
2. A warning has been added such that users will be informed if anti-virus software is blocking their downloads.
3. Modified TDAS software to support to Haje Korth's version 7.5 of the IDL Geopack DLM. The supported operating systems are Linux, Mac, Sun, and Windows. 32 and 64 bit versions are available for all operating systems.
4. The source of an ~63 msec timing discrepancy between 8 ksamp/sec and 16 ksamp/sec EFI burst waveforms has been found. A patch has been applied and L0->L1 and L1->L2 reprocessing will occur by mid January 2011.
5. A patch was made in the L0->L1 spin model processing fixing the extra bits in BAU sun sensor status word that were not masked out, leading to "false positives" in list of eclipse time intervals. The L1 STATE data will be reprocessed for the entire mission by mid January 2011.
6. Fixed problem with precision implementation in TPLOT_ASCII, to allow for better than millisec precisions.
7. Added WRITE_ASCII routine to TDAS distribution. This routine writes arrays to ASCII files.
8. Enhancements to the new TDAS Slices functionality includes:
    a. For 2D slices a nearest neighbor interpolation method added
    b. For 3D option it now interpolates across gaps less thereby better representing the original data
    c. Re-gridding is now faster and less memory intensive.
    d. Export to postscript (.eps) capability added.
9. New SST calibration code was modified to support new energy calibration parameters that are proportional to the reciprocal of the DAP energy boundaries. Code now also inserts NaNs at times when the data has extreme dead time problems.
10. ARTEMIS probes (THEMIS B and C) L2 FGM data, from 1-may-2010 to 10-nov-2010 has been reprocessed using new calibration data.