THEMIS/ARTEMIS Software Users,

The THEMIS/ARTEMIS Project announces the release of Version 7.00 of the THEMIS Science Data Analysis Software. Version 7.00 contains the following significant New Features and Enhancements to the THEMIS Command Line Software (are also available in the GUI unless otherwise noted):

Slices

- The 2d Slices program has added the following capabilities:
  a. ESA/SST data can now be combined.
  b. Contamination/background removal options added.
- Added the ability to automatically remove bins falling below one count from slices plots
- The following updates to the Velocity Distribution Slices have been made:
  a. Keyword simplifications for easier plotting and exporting.
  b. Reduced data is now fully supported.
  c. Minor data gap and overlapping errors fixed. The command line crib can be found at: thm_crib_part_slice2d
- Velocity distribution slices now handles instrument mode changes and notifies the user.

ESA/SST/Moments

- Added erange option to thm_part_moments, added get_error keyword to thm_part_moments and moments_3d. This allows the estimation of uncertainties in moments.
- The code to remove sun contamination from SST data has been made more user friendly through the addition of a new keyword method_clean that takes the values 'automatic' or 'manual'.
- thm_part_getspec program has been fixed to allow negative limits.
- Beta calibration code for the SST is available in this release. Examples can be found in themis/examples/thm_crib_sst_calibration.pro. What is included:
  a. Energy Efficiency corrections from GEANT4 simulation results
  b. Relative anode corrections. Allows proper pitch angle distributions. (Empirical analysis by Drew Turner (UCLA) using Jim McFadden's (UCB) method from ESA.
  c. Improved sun contamination removal code.
  d. Access to SST coincidence channel data (F,FT,FTO,O,OT).
  e. Merged F/FT electron data product (F & FT channels overlap, FT channel shows very little contamination. this code uses the FT energy channels in place of the high energy F channels to get a more accurate product).
  f. Deadtime corrections are disabled by default, but the user can set a deadtime correction via the set_deadtime_correction keyword.
- The array size for ESA data structures has been expanded, to allow loading of longer time periods.
- Added units to variable names and dlimit structures in thm_part_moments.
- Changed deadtime correction program used by thm_load_mom to ensure that all temporary ESA data variables are removed.

Tplot/SSL general

- When creating multiple plots per window using plotxy, plotxyz, plotxyvec, or tplotxy, it is now possible to add an overall title and to create nonsymmetric plot layouts within the window.
- An option to use nearest neighbor interpolation has been added to both the GUI and the command line routine tinterpol_mxn (use keyword /nearest_neighbor).

- The cdf2tplot program now supports the CDF EPOCH16 data type for time variables in CDFs.
- Improved error handling and diagnostic messages for the wavelet2, degap, and dynamic power spectrum (tdpwrspc) routines.
- Tplot crib sheets have been updated and are now in ssl_general/examples.

Other

- The ERG Science Center at the Solar-Terrestrial Environment Laboratory (STEL) of Nagoya University has provided TDAS Users with a plug-in for TDAS to enable users to use the ERG Mission data.
- thm_cotrans now supports coordinate transforms in/out of selenocentric SEL and SSE coordinates.
- Harald Frey's program ("thm_asi_merge_mosaic.pro") has been modified to adjust image projection heights at station interfaces, in order to remove unrealistic, sharp transitions at camera field-of-view boundaries.
- Many 'print' statements have been replaced with 'dprint' statements, to allow users to control the volume of console output by adjusting the !THEMIS.verbose setting.
- TDAS enhancements for applying eclipse spin model corrections are now available (but not used by default) in this release. Data types affected: calibrated EFI, FGM, and SCM waveforms; calibrated EFI and FGM spin fits; and calibrated particle moments.
- The load routines for Kyoto DST and AE data have been enhanced. The routine kyoto_load_dst will now check for final, provisional, or realtime data.
- Fixed problem where sites to be excluded from AE index calculation due to bad data are not present in full site list.
- A number of new keywords have been added to thm_load_gmag to load magnetometers from U of Alaska, MAACS and Greenland networks. See thm_sites, tgo_sites, dtu_sites, ua_sites, maccs_sites. The relevant cribs (thm_crib_gmag, thm_crib_greenland_gmag, thm_crib_maccs_gmag) have been updated to illustrate the use of these keywords.
- Code has been added to calculate L-shell values based on spacecraft position.

THEMIS/ARTEMIS Science Team