

## Software Task Priorities (In Play / In the Queue) - 1/7/08

Jim L.

1. Compress and Decompress routines for MOMs. BugzID=81  
(On Hold) ready for packets from Peter
1. Compress and Decompress routines for Fields. BugzID=81 (Performance testing in progress)  
ready for packets from Peter
1. L1 File definitions Document. BugzID=xx. (In Progress - target 1/31)
2. Split the input telemetry file into (possibly multiple) single-SCID files, then process only the ones that correspond to valid THEMIS SCIDs (will work on 1/7-1/11)
2. Log File Processing
  - a. Issue a log msg for any VC files which contain mixed SCIDs or otherwise invalid transfer frames.
  - b. Each processing script should, at the very least, take a command-line option specifying a log file where sufficiently-important messages can be written.
  - c. Log message format is TBD, but should probably include:
    - 1) wall clock date/time when the log message was generated
    - 2) A file or directory name identify the input data that provoked the msg
    - 3) A severity field (e.g. "info", "warning", "critical")
  - d. Modify lzp\_wrapper and process\_lzp\_dir scripts. BugzID=49.
  - e. Clean-up current VC->L0 processing scripts temporary files. BugzID=50.
  - f. Unexpected transfer frames time matched packet time yet in the past. BugzID=38.
3. Help out with Compression Flatsat Testing
3. L0 to L1 processing: look ahead to the next packet before processing the current packet. BugzID=67
4. FGM range changes in the mid packet. Post Proc maybe a solution to eliminate the spike. BugzID=44.
5. Provide Higher Cadence State Files - Spin period and spin phase - double precision. BugzID=91
6. Non Monotonic timestamps. BugzID=72
6. Invalid data causes aborts in L0 Processing. BugzID=95

Tim

1. Summary Plots - 7 days back
1. Add Moziacs to where ASI Plots are once Jim M. has completed the wrapper.
1. Verify new Memory Statistics plot on Tohban plot once Jim M. has completed.
1. Investigate retrieval of additional datasets from the Canadian (CARISMA)
  - a. ~~Send to U. Alberta IDL code for edf conversion~~
  - b. Stats of usage of data for current 5 stations
2. High-pass filter function.(for Vassilis)
3. tsmooth2 needs to accept a time keyword (say, seconds) rather than # of points. (for Vassilis, Davin)

Jim M.

1. Reprocess all L2 ESA
1. units still appear as [nT] and [ADC]. I thought that was eliminated at some point, but they seem to have reappeared both in the tohban FGM plots and in the overview plots. Can you fix at least in the FGM tohban plots? I suspect it may be because the broken code was fixed in the bleeding edge but not in the QA. (12/18).
1. Reprocess Overview and tohban plots (12/18)
1. Tohban memory statistics (from Andreas - Andreas has sent routine to Jim)
1. Mozaics (from Harald), in progress. Ready for Tim?
1. Awaiting new routine from Jim McFadden (January) then
  - a. check in routine and test using the bleeding edge
  - b. test using the 3.0x branch, build 3.03, release 3.03 (Tim and David)
  - c. reprocess all L2 ESA
1. Decouple display variable types in the 'Choose Data widget' from the valid data types in thm\_load\_\*.

Jim M. (continued)

## 2. Vladimir Help Request

- a. fit efs data as zeroes for the dates 2007/3/21 - 28. Isn't it better to put there fill values if you do not have measurements?
- b. It would be good to be consistent with the fill values and use the same everywhere - NaN or 0 or 1.e31. Generally, it is better to use a number as this is a standard everywhere else.

## 2. GUI Variable Info widget (Check Priority with Vassilis)

## 2. ESA and SST Tohban plots

## 2. FIT/MOM (Onboard) in separate L2 cdf's

## 2. MOM L2 CDF and as part of task put Coord Systems into metadata

## 2. GMAG Stack Plots - In progress few more Spikes, limits changed, reprocess. BugzID=86

## 3. SVD-FIT instead of POLY-FIT - from Vladimir

## 3. Review Patches for CDF's to increase speed

## 3. Overview plot change: mode bar seems thick (nothing we can do easily - low priority)

## 3. Administrator's Guide, Virtual Machine

## 4. GUI Mods

- a. Save Ascii - fix precision, add header (with Pat for UCLA)
- b. button for postscripts (for Stephen Mende)
- c. thm\_ui\_config bug found by Davin
- d. No dialogue box appears for save ascii, no file location in msg box
- e. See email with history file ...231920 abort.
- f. Upper flatfile button (for Vassilis, work with Kate / UCLA Splash)
- g. Add new coord transf options to SM, GSM and GEO into GUI
- h. buttons on overview plot sub widget for fgm, esa and sst Tohban plots

## 5. GUI Mods

- a. current plot window - tell you which one (for UCLA)
- b. Lower flatfile button (for Vassilis / Chris Russell)
- c. Label S/C Position button (GSE or GSN - default) (for UCLA)
- d. De-Gap widget add units
- e. DP - Delete or Overview Plot or Clear History - warning message
- f. Long Variable Names truncated in IDL-D

Pat

## 1. tcrossp error fixed. v3.03?

## 1. ttrace crib - unable to recreate Vassilis's issue with 3d plots.

## 1.

## 1. wavepol.pro and twavepol.pro - When cribs from Chris Cully, Bob Strangeway, and others received, condense cribs and add to the distribution.

### ~~a. Check in Kaori's crib~~

## 1. Ground Trac and tplotxy routines and to finalize crib sheet cribsheet plots footprints and equatorial trac for 3/23 on probe 'C'. IDL scatplot, Harald's routines. Vassilis list of mods in progress:

- a. Could not call trace T01
- b. tplotxy and time
- c. arrays tplotxy.pro
- d. refined equatorial / ionospheric tracing
- e. tplotxy
- f. colors
- f. zig-zag curve

## 2. New overview plot - summary of fields and moments and a crib sheet that shows people how to create spin resolution overviews (bgmom overviews - for Bfield and ground processed moments). In progress.

## 2. VMO Deliverables: data product description files

Step 1 - vet James Weygand's products

Step 1 - fgm L2 cdf for one probe, Step 2 - fgm L2 cdf for all probes

## 2. "th?\_fgs\_sigma" and "th?\_efs\_sigma" to the FIT CDFs (L1) and this should make it to the L2 CDFs as well,

Pat (continued)

2. Mini language to operate on tplot variables - first provide concept write up
3. boundary normal coordinates. On Hold. BugID=59.
4. Christine's code to rotate the XY coord's along Earth direction was very effective. Also it was used by others. We need to streamline it, and its very similar to the others you've already written.
4. Tplot auto scaling. BugID=41.
4. invalid inputs to the version keyword
4. Clean-up of makepng and makegif

Bryan

- 1e. Add reduced mode capability for energy/angular spectra
  - 1e.1 Modify THM\_SST\_P\*\*\* codes to use NaNs instead of zeros to blank the sunpulse.
  - 1e.2 Modify THM\_PART\_MOMENTS2 to handle sun blank NaN's instead of zeros
  - 1e.3 Add reduced mode capability for energy/angular spectra
2. Generalize code by removing hardwired angle maps (i.e. turn energy/angle bins on/off using dat structure)
2. Add ability to calculate theta angular spectrum
2. Add ability to calculate pitch angular spectrum
2. Add ability to convert to GSM coordinates (requested by Kaori)
3. Overplotting of not just lines and spectra, but also spectra over spectra. This means that the gap would be filled if another plot is below it. This way the data would not have to be merged, just tplot has to account for gaps and plot them as true gaps. (Submitted by Vladimir)
3. thm\_load\_state - phase I
  - a. hardcode (units = "km/s" or "km", or "deg")
  - b. finish "no\_update" loading option (consult with Davin)
  - c. Finishing the coordinate transformation of the thm\_load\_state data at input, to include transformation of spinaxis attitude, need to determine keyword switch, implement the rotation of the spinaxis elevation/azimuth from gei to arbitrary coordinates (consult with Pat, Vassilis and Ken)
3. thm\_load\_state - phase II (consult with Ken)
  - a. For STATE CDF files, the following variable attributes should be defined, consistent with they way they are defined in the L2 FGM file: units, coordinate\_system (consult with Jim L.)
  - b. Once defined in the CDF, thm\_load\_state should take the values from the dlimits.cdf.vatt to set the metadata for the tplot variables: dlimits.data\_att.units, dlimits.data\_att.coord\_sys
  - c. For thm\_load\_state, the suffix gets added to support data, but support data is not transformed: if you call thm\_load\_state, coord='gse', suffix='\_gse', /get\_support\_data only the pos and vel get transformed, but all get the \_gse suffix.
  - d. in thm\_load\_state, the code to delete support data that was loaded for coordinate transformation should be just del\_data, '\*\_state\_temp'
  - e. THC braid photoelectrons
4. upgrade thm\_load to work with probe assignments
5. move functionality of thm\_load\_state2 into thm\_load\_state and delete thm\_load\_state2
6. Shadow Indicator (for Vassilis - using functionality in ...load\_state2 and tplot roi)
7. Multiple enhancements concerning keywords, valid\_names and thm\_load routines

Ken

1. thm\_cal\_scm bug using a special Fmax error msg Variable undefined F2.
2. Send David list of GUI bugs
3. Themis SCM CAL File Processing - produce table of contents and assign sections with Patrick R.
4. Themis System Administrators Guide
5. Themis Developers Guide

Harald

1. Mozaics code
2. Validate Tsygenko work from Pat (Feb-March 2008)

Andreas

- ~~1. MAP L2 Data descriptions (Current and Permanent)~~
2. L2 File Definitions Document - awaiting L1 document to be completed to use as template

Christine

1. Correlation and dynamic correlation code: include these 2 routines and make a wrapper that works with tplot variables (and possibly interpolation if necessary)

Vladimir

1. Help Requests from Vladimir
  - a. fit efs data as zeroes for the dates 2007/3/21 - 28. Isn't it better to put there fill values if you do not have measurements? - assigned to Jim McTiernan
  - b. It would be good to be consistent with the fill values and use the same everywhere - NaN or 0 or 1.e31. Generally, it is better to use a number as this is a standard everywhere else. - assigned to Jim McTiernan
  - c. Overplotting of not just lines and spectra, but also spectra over spectra. This means that the gap would be filled if another plot is below it. This way the data would not have to be merged, just tplot has to account for gaps and plot them as true gaps. -assigned to Bryan
1. Magnetopause Coordinates
  - Zero order step to create pre-processed solar wind data
  - Coding done and testing in progress
  - Send David spiking routine for the distribution
2. Shue MP routine

Thomas Moreau

1. Create IDL code to make an L1 ESA cdf.
2. Create IDL code to read L1 ESA cdf with the same functionality as Jim McFadden's L0 code.

UCLA

1. Clean-up the power ripples from the FGM data. (Krishan)
  - Awaiting new programmer

Software Tasks To Be Discussed (TBD) / To Be Assigned (TBA)

1. TBA - Tweaks for \_dot0 and \_0 for subspin resolution (for John - tbd)
2. TBA - Implementation of the removal of the spin-independent and -dependent offsets (for John)
3. TBD - print, dprint, msg continue, verbose options for a standard
4. TBD - Mini Language to operate on tplot variables
5. TBD - Administrator's Guide
6. Hold - Themis E-Field Data (Forrest, John)

## **THEMIS Science Data Analysis Software Monthly Accomplishments – January 2008**

### THEMIS Trainings and Meetings

### THEMIS Science Operations Center (SOC), GBO, Ground Processing and Probe Data Processing Tools

### THEMIS Web Site

1. IDL\_Geopack: The stop condition for field line tracing was incorrect and this was producing noise in the z-axis of equatorial field line traces. The stop condition was corrected.

### THEMIS Data Products

### THEMIS Science Data Analysis Software (Release Version Incremental v3.03)

1. GUI FBK data that appear for loading on sub widget.
2. thm\_cal\_scm bug fix from Ken.
3. Decouple display variable types in the 'Choose Data widget' from the valid data types in thm\_load\_\*.

### THEMIS Science Data Analysis Software (Bleeding Edge Distribution - post v3.02)