Software Task Priorities (In Play / In the Queue) - 1/28/08

Jim L.

- 1. Email to send to Tohbans on reporting missing data (awaiting feedback from Jim M. and Tim)
- 1. Compress and Decompress routines for MOMs. BugzID=81
- 1. Compress and Decompress routines for Fields. BugzID=81 Test patterns (couple of packets for each appid) for MOMs and Fields verified. Awaiting output of Flatsat or Orbit Testing
- 1. L1 File definitions Document. BugzID=xx. (In Progress target 1/31)
- 2. thm_load_state changes to load L1 spin model cdf by default.
- 2. thm cotrans changed to use spin model instead of current miethod of interpolationg spin period. Code will be review with Hannes before testing begins. Once Jim complete's his testing Hannes will be asked to QA new functionality.
- 2. Bfield mid-packet jumps.
- 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.
- 2. 2007 Reprocessing for R-S errors (probably HKP not SCI)
- 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

Tim

- 1. Reprocess Overview and Tohban plots from Nov.
- Reprocessing from beginning of Mission keeps aborting.
- 1. Add Moziacs to where ASI Plots are once Jim M. has completed the wrapper.
- 1 Investigate retrieval of additional datasets from the Canadian (CARISMA)
 - a. Stats of usage of data for current 5 stations (Feb 2008). In progress.
- 1. Feedback to Jim Lewis on Tohban FAQ
- 2. tsmooth2 needs to accept a time keyword (say, seconds) rather than # of points. (for Vassilis, Davin)
- 3.GMAG Stack Plots In progress few more Spikes, limits changed, reprocess. BugzID=86

Jim M.

- 1. FIT/MOM (Onboard) in separate L2 cdf's, and as part of task put Coord Systems into metadata.
- 1. Feedback to Jim Lewis on Tohban FAQ
- 1. thm load mom, thm cotrans and thm load esa changes

a. Add coord labels to thm_load_mom: Thm_load_mom should properly label the coordinate system of any 3-d data in the dlimits structure.

b. Add coord labels to thm_load_esa: Thm_load_esa should properly label the coordinate system of any 3-d data in the dlimits structure.

Jim M. (continued)

2. L2 Reprocessing

- a. Of the 311(!) files that weren't processed, 292 were missed because there is no longer an L1 file present for the approvate date and instrument. (There must have been files there at some point, though.)
- b. Of the those files, 18 are FGM files in the time period 2007-04-26 to 2007-05-01. The current L2 process ignores those dates, I believe, because there were issues with the coordinate transforms. I guess that i need to revisit this issue.
- c. Ths other one is thb_l1_esa_20071128_v01.cdf. This is odd -- since it had been reprocessed on 25-Dec, and nothing changed in the ESA code between then and this last reprocessing.
- 2. Extraneous scmcal directory under L1 products. BugzID=98.
- 2. SI_Conversion attribute for peif density is incorrect. It has 10^6>m^-3 rather than 1e6>m^-3. Wait until someone complains before reprocessing. Jim must check othe meda-data.
- 2. Decouple display variable types in the 'Choose Data widget' from the valid data types in thm_load_*.
- 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. ESA and SST Tohban plots
- 3.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

<u>Pat</u>

- 1. Sort out DC Electric Field issue from Wenlon Liu.
- 1. Ground Trac and tplotxy routines and to finalize crib sheet cribsheet plots footprints and equatorial trac for 3/23 on probe 'C'. Awaiting Vassilis to review.
- 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. Awaiting Vassilis review of plots and answer question (s0 on spin resolution.
- VMO Deliverables: data product description files
 Step 1 talk to Jan about AGU VMO products presented
 Step 1 fgm L2 cdf for one probe, Step 2 fgm L2 cdf for all probes

Pat (Continued)

2. thm_load_mom, thm_cotrans and thm_load_esa changes

- a. Error on no coord sys in thm_cotrans: When using thm_cotrans if no coordinate system is provide by the user or is available in the dlimits structure the procedure should generate an error
- b. Error on coord sys conflict in thm_cotrans: If there is a conflict between user specified coordinate system and dlimit coordinate system when using thm_cotrans an error should be generated.
- c. Ignore_dlimits is a new keyword in thm_cotrans: There should be a keyword called ignore_dlimits in thm_cotrans such that if there is a conflict between the dlimits coordinate system and the user specified coordinate system the user coordinate system will be used for coordinate transformation and no error will be used.
- d. thm_load_mom's datatype keyword should be implemented.
- 2. "th?_fgs_sigma" and "th?_efs_sigma" to the FIT CDFs (L1) and this should make it to the L2 CDFs as well.
- 2. IDL v7.0
- 2. Mini language to operate on tplot variables first provide concept write up
- 3. boundary normal coordinates. On Hold. BugzID=59.
- 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
- 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. BugzID=41.
- 4. invalid inputs to the version keyword
- 4. Clean-up of makepng and makegif

<u>Bryan</u>

1. Add ability to calculate theta angular spectrum

a. generalize domega calculations for arbitrary angle maps (and implement in phi spectrum as well)

- 1. Add ability to calculate pitch angular spectrum
 - a. allow angle bins to be broken down into smaller (user defined) sub-bins
- 1. Add ability to calculate gyro phase 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.

Bryan (continued)

- 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 Bryan (continued)
- 6. Shadow Indicator (for Vassilis using functionality in ...load_state2 and tplot roi)
- 7. Multiple enhancements concerning keywords, valid_names and thm_load routines

Michael

- 1. Orientation
 - a. SVN setup and review crib sheet and other materials
 - b. Review Users Guide
 - c. Detailed understanding of the EFI experiment/task with John Bonnell (1/29)
- 2. Develop a prototype version of the EFI offset and correction algorithm.
 - a. Review "Mozer in a box" (Chris Cully's code) and use as a template.
 - b. Construct the basic algorithm: Load data in SPG frame, Remove constant offset in E12 and E34 (spin plane), Zero E56 for now, Convert to DSL frame.
 - c. Design prototype to read calibration offsets from a file.
 - d. Document offsets and corrections in data attributes structure.
 - e. Incorporate subtraction/correction code into LOAD/CAL suite (tbd) later after prototype has reached some level of maturity).
- 3. Build an informational widget to route the output of tplot_names to a text box.
 - a. Study widget building.
 - b. Review J.M.'s thm_ui_error and associated routines.
 - c. Possibly hack tplot (talk to Davin and Jim Mc before doing)

<u>Vladimir</u>

1. Magnetopause Coordinates

Zero order step to create pre-processed solar wind data

- Awaiting Vassilis's review of Solar Wind crib and code
- 2. Shue MP routine
- 3. Outlier Routine awaiting Vassilis Review
- 3. 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

Christian Jacquey and Thomas Moreau

- 1. Converging toward our primary goal, i.e., to interface the THEMIS data with the CL software. It is almost finish for the ESA data, some details are now being fixed and then we will go to the SST data.
- 2. We have finished the migration of our server. The mirror THEMIS database is now opened and can be used at the REMOTE DATA DIR for TPLOT. We tested it. It seems to work proprely and thus, this could be communicated to the THEMIS communityEmmanuel Penou will communicate soon with Tim Quinn on this topic.(*Did this happen?*)
- 3. Tested TPLOT by using the mirror database as the REMOTE DATA DIR. It seems to work. The possibility of using the CDPP/CESR mirror database as an alternative remote data dir could be opened to the whole THEMIS Community, if you agree.
- 4. CDPP/CESR is in discussion with the GFI company for prolongating the contract in order to develop and provide the code for producing the new ESA L1 data in the cdf files, as asked by Vassilis. The following sub-actions are planned:
 - a) writing a document describing all the objects to be contained inside the new L1 CDF files.
 - b) sending this document to you for validation of the specifications of the new L1 data.
 - c) developing the code for producing the new ESA L1 files
 - d) testing and validating the code
 - e) writing the code documentation (user guide)
 - f) develop a new version of the TPLOT module reading the new ESA L1 data files.

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
- 6. If requesting 1 hour of data using timespan, then load data using one of our load data routines, the load Recommend if there is a fix at the load cdf level.

Vassilis

- 1. Check out Outlier routine from Vladimir.
- 1. Check out Solar Wind crib and code from Vladimir.

UCLA

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

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)

<u>Harald</u>

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

Andreas

1. L2 File Definitions Document - awaiting L1 document to be completed to use as template

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

- 1. TBD L2 State file V03.
- 2. TBD print, dprint, msg continue, verbose options for a standard
- 3. TBD Mini Language to operate on tplot variables
- 4. TBA Tplot FAQ's (Amanda)

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)

- 1. You can now plot phi-angular spectra of ESA in reduced mode (24x50) which is what we get in Fast Survey, and be sure it is accurate for every probe. As before directional E-spectra are also possible (good for timing). As before, see thm_crib_part_getspec.pro for details.
- 2. High-pass filter function.