

Software Task Priorities (In Play / In the Queue) - 2/25/08

Jim L.

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 Orbit Testing
Update production code to be ready for new compression algorithms - ideally before flight software patches are uploaded to the probes.
1. FGL issue. We have learned that FGL data from probes C, D and E has a 0.25 sec timing error, starting in summer 2007, and continuing to the present (Feb 2008) time. We would like to fix these timestamps in the L1 CDF files. Process should be generic so future corrections can be easily handled. Steps or tasks:
 - a. Determine correction (Sci team)
 - b. Detect dates for each probe all the back to start of mission(Hannes)
 - c. create a file of known corrections for each probe. File should be in SVN.
 - d. create a flag for the affected L1 variables somehow, to prevent confusion about which corrections have or have not yet been applied. So each entry in the proposed correction file should have some sort of tag identifying what the correction is, which could be looked up in the CDF as a variable, variable attribute, or global attribute.
 - e. Change L0-L1 code to take corrections into account.
 - f. **Jim M. L1-L2 auto?**
1. Feedback on the skeleton of the CDF ESA L1 data file based on the IDL structure's content of the Jim's L0 code from Thomas by 2/11. **Jim awaiting confirmation of info on modes from Jim McFadden.**
Awaiting sit down with Davin to discuss which support variables are in/out new esa cdf.
1. Add feedback suggestions from Andreas to Tohban Info and send to David for turnover to Jonathan.
2. Log File Processing (in progress)
 - 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. thm_load_state changes to load L1 spin model cdf by default.
2. See Michael to make any changes required for despin development for efi.
2. 2007 Reprocessing for R-S errors (probably HKP not SCI)
2. L1 File definitions Document. BugzID=xx. **Awaiting word doc from Amanda/David.**
2. thm_cotrans changed to use spin model instead of current method of interpolating spin period.
Code will be review with Hannes before testing begins. Once Jim completes his testing Hannes will be asked to QA new functionality.
2. Bfield mid-packet jumps.
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

Jim M.

1. Mozaic Processing catching up. **Catch-up expected by 2/29?** Verify the process works after catch-up.
1. Pressure calibration issue with SST moments. Determine extent of issue and turn over to Davin.
With latest mods all probes off by a factor of 100.
1. thm_load_sst abort (support request from Chih Ping/Bryan) missing data program aborted.
1. MOM and FIT (Onboard) in separate L2 cdf, and as part of task put Coord Systems into metadata.
ESA L2 cdf with updated labels. Left to do:
 - a. mods to be made to FIT master cdf
 - b. Regenerate MOM, ESA and FIT **test (?)** cdf's and notify SPDF and QSAS
 - c. User's Guide, Data Description list updates?
1. Implement Moment Overviews (from Pat) into production and let Tim know it's ready.
1. SST L2 cdf upgrades
1. thm_load_esa changes
 - a. 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.
2. "th?_fgs_sigma" and "th?_efs_sigma" already in L1 CDFs per Jim L. and need to be copied into L2 cdfs.
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 appropriate 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. The other one is thb_11_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. thm_load_mom 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. read mom l2 cdf's
 - c. thm_load_mom's datatype keyword should be implemented
 - d. reconcile mods with Davin
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. 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

Jim M. (continued)

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

Tim

1. Review Mirror site processing - may need to hold them back for new server to get setup.
France turned back on, Japan awaiting things to settle down.
1. Mozaics cron job not restarted after server switch?
1. Mozaics bug on ASI web site - must click +3 sec to get display. – in progress
1. When Jim M. finishes his part install Moments Overviews (from Pat) link on the web site – Select Type on the Summary Web Page drop down Menu (ESA Ground MOMS, ESA Onboard MOMS)
2. High Pass filter function few tweaks left to do.
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

Pat

1. tplotxy and the ttrace_crib mods per Vassilis (**Completed - Review with Vassilis week of 2/25**):
 - a. Change tplotxy/plotxy behavior to generate isotropic plots by default.
 - b. Take tplotxy should read title information from dlimits by default.
 - c. Code documentation(header) should explain how the dlimits are used by tplotxy.
 - d. Multiple plot convention should agree with the convention used by idl !P.multi keyword.
 - e. When replotting a plot using plotxy/tplotxy called with no arguments it should not store xsize, ysize, and any other windowing information.
 - f. tplotxy/plotxy crib examples should be in re not km.
 - g.. tplotxy/plotxy should include examples of font manipulation.
 - h. tplotxy/plotxy should include examples of the xrange/yrange keyword.
 - i. The crib should use plotxy to demonstrate plotting using arrays
(not just call plotxy implicitly from tplotxy calls).
2. Write a procedure that will plot spectrographic data versus position. This procedure will be called plotxyz.
It should work with plotxy so that line and spectrographic position plots can be mixed in the same way that tplot can perform line and spectrographic time series plots. ** Design approved by Vassilis **
2. VMO Deliverables: data product description files
 - a. Review FGM SPASE numerical data and instrument files for all probes.
 - b. Review Ephemeris SPASE numerical data instrument files for all probes.
 - c. Review Observatory files for all probes and the person file for Themis.
 - d.(option 1) Generate an instrument file for Thermal Plasma measurements(Moment Temperature) then numerical data files for this quantity for each probe, repeat this process for other moments.
 - d.(option 2) Generate an instrument file for EFI or SCM and corresponding numerical data files for each probe.
 - d.(option 3) *Cease doing VMO for a bit.*

Pat (continued)

2. Variable units – generic solution

thm_load_spin.pro, thm_load_state.pro, thm_load_hsk.pro, thm_load_sst.pro
thm_load_esa.pro, thm_load_bau.pro, thm_load_fgm.pro, thm_load_fbk.pro
thm_load_fft.pro, thm_load_fit.pro, thm_load_scm.pro, thm_load_efi.pro
thm_load_trg.pro, thm_load_asl.pro, thm_load_gmag.pro, thm_load_ask.pro
thm_load_mom, thm_load_esa_pkt

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.

3. wavpol.pro and twavpol.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

Bryan

1. Bug fixes

a. Bug in thm_part_getanbins that fails to properly handle cases when no phi bins occur within PHI range.

b. Bug in them_part_getspec causing fgm data to load if angle keyword not set.

c. Bug in thm_part_moments2 that senses incorrect angle mode at the beginning of given timespan.

d. Account for fact that thm_sst_* doesn't set dat.mode

- make output echoing current angle mode more user friendly by outputting numbers of energies/angles.

1. Testing Davin's implementation of the 6-angle pser code. For now, I've made the requested changes to my own local copy of the code in order to test how well my code handles 6-angle pser data. I've since found a bug with my code in how it handles the 6-angle data. Bug has been fixed. **Need info from Davin.**

1. Add ability to calculate pitch angular spectrum - in progress

a. incorporate fac_matrix_make and tvector_rotate

b. allow angle bins to be broken down into smaller (user defined) sub-bins

1. Add ability to calculate gyro phase angular spectrum (in parallel with pitch angle development)

2. Tplot issue with angle mode changes. Since tplot only works with square arrays, it can't plot a time range that contains an angle mode change in which the number and distribution of the angles (y-axis) changes. The user is forced to limit the timerange that contains only the angle mode in which they're most interested.

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)

d. minor bug found by Pat (email of 2/15/08)

Bryan (continued)

3. thm_load_state - phase II (consult with Ken)
 - a. For STATE CDF files, the following variable attributes should be defined, consistent with the 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

Michael

1. Develop a prototype version of the EFI offset and correction algorithm.
 - a. Code evolving and testing of algorithm in progress
Determine if the SCM generic despin routine should be used for efi.
 1. Y title utility - **awaiting review from John Bonnell**
 2. Compare and contrast SCM and C. C. despin - in progress.
 3. Get despinning with EFI data with SCM code to work.
 4. Generate plots of a few spins/page to examine algorithm(s).
Second set of plots given to John Bonnell. **Awaiting feedback.**
 - b. Document offsets and corrections in data attributes structure - in progress
 - c. Incorporate subtraction/correction code into LOAD/CAL suite (tbd)
later after prototype has reached some level of maturity).
2. Build an informational widget to route the output of tplot_names to a text box.
 - a. Rewrite widget to display contents of default limit structure (left justify tweak)
 - b. "Wire" widget into thm_gui based on some generic tplot variable.
 - c. Update event handling to recognize clicking on a particular tplot variable name.
 - d. Debug cross-platform compatibility.

Hithesh

1. Read the THEMIS IDPU Software Design overview - in progress
2. Discuss any questions with Peter - ongoing
3. Work with Peter on changes to the THEMIS Solid State Telescope flight software. Testing on workbench and Flatsat complete ready for upload.
4. Test changes for FGM data (apid 460, 461) to use algorithm 5 (three-channel delta mod) for compression.
5. Moments triggering off of the density and pressure for the day side. Begin week of 2/25-2/29.
(work with Curtis Ingraham)

Vladimir

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. (Jim M.)
- 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

Hannes

1. Determine for all probes from start of the mission when the fgl issue

(as described in Jim Lewis's list) occurred and a program that can be run

monthly to determine if it has occurred again. In progress to be completed by 2/29.

1. V03 - L2 State cdf.

- a. definitive attitude info - in progress
- b. See email concerning parms ("thx_sci_mode", "thx_hsk_issr_mode")
- c. quality flag for FGM data
- d. spin model data (talk to Jim Lewis)

Davin

1. Pressure calibration issue - factor of 100 difference between ps?f_density and ps_m_density for all probes.

1. thm_load_mom - SST calibration onboard mom issue.

2. Email from Bryan: It turns out that the latest version of thm_sst_dist3d_16x6.pro in the trunk didn't have the replication of dat.dtheta for all energy channels.

Vassilis

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

David

1. Science Software Analysis distribution list- update.

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)

Harald

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.

UCLA

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

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 properly and thus, this could be communicated to the THEMIS community Emmanuel 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 CDDP/CESR mirror database as an alternative remote data dir could be opened to the whole THEMIS Community, if you agree.
4. CDDP/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.
5. Related to #4.
 - a) define and write a new skeleton cdf file that would be use as a data model for producing the new CDF ESA L1 files. This task needs to reconstruct entirely the skeleton of the CDF ESA L1 data file based on the IDL structure's content of the Jim's L0 code.
 - b) submit skeleton together with a text file listing all items contained within the new model to Jim Lewis for feedback and validation by 1/22.
 - c) Develop the code assigned to create and read L1 ESA cdf files. 3-4 weeks should be sufficient.

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.

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

1. TBD - print, dprint, msg continue, verbose options for a standard
2. TBD - Mini Language to operate on tplot variables
3. TBA - Tplot FAQ's (Amanda)
4. TBA - Sun Pulse contamination not removed yet (for Davin).
5. TBD - Test Suite to test despin - from Science Team
6. TBA - Data contain engineering, deployment, maneuver, and science data are in the same stream.
From the data description, only maneuver flag state_man is provided. Do you provide information about the time intervals when the data are on, say, engineering level? This data, though valuable in many respects, may be confusing if interpreted as science data. To provide such information, it is possible, for example, to add some bits to existing state_man flag. (from Vladimir)