Tim

1. Start Reprocessing of all overview plots.
   [Note: Tim to start reprocessing tomorrow all times after Sept. 2007; earlier times will await OK by Jim M. to ensure fitmom plots don't bomb if Pat's code throws an error because data were not correct prior to that.
   Note: New key has been installed.]
1. ~~Inventory of Products, monitoring and building new alarms for Production Data Processing.~~
   ~~Draft document produced. Next version with Harald's info as well.~~ **Send copy to David**
1. 12 ASI drives, 10 off-loaded, 2 still to be done.
1. Email U. Alberta:
       a. What is the status of the other station's cdf's (other than the 5 they are sending)
          UCLA gmag format.
       b. Status of ATHA and SNJQ
       Press Dave Milling (?) for data.
1. Review Mirror site processing - see if Austria can get there data for mirroring from France.
   Austria talking to French. Should press for this action. [Looks like they are working OK]
   Japan mirror: Alerted them to how to do a better job in copying without cobbering the bandwidth.
1. The Ekati GBO has been redeployed to Yellowknife. We're getting ASI data but no mag data yet - it's probably too cold to get it in the ground. I'm waiting for site information in order to make the master cdf, and mag cdf production will begin once data starts flowing in. We started receiving data on March 11. The first full day was March 12th. The CDFs are good so SPDF can start to serve them up. Site reconfigured to show imaging data and GMAG data properly. Done?
2. 20 Themis scripts review to optimize processing.
2. Tohban's need ACE data downloaded. IDL Crib sheet to use ACE data. [Done, however, Jim M. will send a directory tree structure and Tim will implement ACE data structure to be same as the rest of the THEMIS data].
3. **Review Jim L.'s Log File Processing tasks #2b and #2c.**
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2. ~~Support Amanda with Web Page updates as follows:~~
   ~~a. update the beta web site to be identical to the official web site if they are currently not in sync.~~
   ~~b. Making a change to the beta site~~
       c. Transfer mod from the beta site to the official site.

Hannes

1. Determine for all the probes for all the days 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. to be completed by 3/7.
2. V03 - L2 State cdf.
       a. definitive attitude info - in progress
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       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)

<u>Jim L.</u>

1. Compress and Decompress routines for MOMs. BugzID=81, for Fields. BugzID=81.
   ~~All probes have patch and results look good.~~ More extensive test awaiting completion of the tail season.
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. Detect dates for each probe all the back to start of mission (Hannes)
     b. after #a completed, finalize correction file, changes into prod.
     c. Reprocess prod L 1 with corrected times.
     d. **Inform Jim M. so he can do a separate reprocessing of L2.**
     e. 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. (low priority)
     f. Change L0-L1 code to take corrections into account. (low priority)
1. L1 Mods and Reprocessing
     ~~a. L1 FIT CDF has bad DEPEND_TIME attribute values (leading blanks) BugzID=107~~
     ~~b. Better choice of fill values for missing FIT samples. BugzID=108~~
     ~~c. Missing DEPEND_TIME attribute in EFF, EFP, EFW L1 CDFs. BugzID=10~~
     d. Missing attributes in SST L1 CDF. BugzID=110 **Awaiting feedback from Davin.**
     e. Possible additional fgl reprocessing. (in case Hannes finds new time intervals).
     f. 2007 Reprocessing for R-S errors (probably HKP not SCI) will be done as part of #g
     g. Reprocess all L1 cdf's from launch
1. L1 ESA cdf skeleton - feedback received from Thomas. **Jim L. to talk to Jim McFadden and Davin.**
2. Log File Processing (in progress) due 3/27
     ~~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. **Sort out formats with Tim.**
     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")
       Review with Tim.
     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. Update v3.02 QA Test Scripts for front end processing to incorporate any changes made by Tim and Jim L.
2. Perform v4.0 QA testing.
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2. L1 SST changes - **coordinate with Jim M.**
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. 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. 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

<u>Jim M.</u>

1. ~~thm_cal_scm bug using a special Fmax error msg Variable undefined F2.~~
1. Mozaic Processing catching up. New computer approved and ordered. **Processing 2/26 as of 3/24.**
   Verify the process works after catch-up.
1. MOM and FIT (Onboard) in separate L2 cdf, ESA L2 cdf with updated labels. Left to do:
   - a. New test files for MOM, ESA and FIT cdf's created, SPDF and QSAS notified.
     Initial feedback from Bob Mcguire:
     1. Instrument description links for MOM and FIT aren't working correctly.
     2. Many variables in MOM e.g. appear to contain only zeros, noise spikes and/or fill values. Or are suspiciously flat. Lots of spikes or peculiar looking cutoffs in FIT variables. Maybe validmax values that set too low or something else that gives the appearance of saturation effects? I have general concerns with overall data quality and completeness.
   - b. Start reprocessing.
   - c. User's Guide, Data Description list updates.
1. Reprocess all overview plot data
   - a. Analysis of error messages "invalid cdf errors" with l2 cdf's for fgm, state and hsk.
   - b. Start Reprocessing Jim notified Tim.
2. A separate paragraph or couple sentences on each L2 cdf's that are available to the public.
2. Bug report submitted by Michael. Jim could not recreate.
2. ~~High Pass filter function few tweaks left to do~~ **Awaiting feedback from Vassilis.**
2. ~~tsmooth2 needs to accept a time keyword (say, seconds) rather than # of points. (for Vassilis, Davin)~~
2. GMAG Stack Plots - In progress few more Spikes, limits changed, reprocess. BugzID=86
2. FFT (onboard) L2 cdf

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3. Decouple display variable types in the 'Choose Data widget' from the valid data types in thm_load_*.
   - Partially done.
3. 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_asi.pro, thm_load_gmag.pro, thm_load_ask.pro
   thm_load_mom, thm_load_esa_pkt
4. If requesting 1 hour of data using timespan, then load data using one of our load data routines.
   Recommend if there is a fix at the load cdf level.
4. Themis SCM CAL File Processing - produce table of contents and assign sections with Patrick R.
   Turnover from Ken
5. Administrator's Guide
5. Themis Developers Guide
6. thm_load_mom changes
   a. reconcile mods with Davin at an appropriate time.
6. SST L2 cdf upgrades - coordinate with Jim L. (L1 cdf changes)
6. Overview plot change: mode bar seems thick (nothing we can do easily - low priority)

    <u>L2 Product Status:</u>
    Completed: ESA, MOM, FIT (onboard), FBK, FGM, SST (needs upgrades), GMAG
    Yet to be done: FFT (onboard), SCM, EFI, ASI (Harald)

Pat
1. Plots for Vassilis using the plotxyz routine.
      a. Write a routine that will generate a scalar field of average moment quantities over long periods of
        time. (1 month to the length of the mission)
      b. Write a routine that will generate a gradient from this scalar field.
      c. Write a routine that calculates an instantaneous gradient by looking at differences between satellites
        when they pass close to each other and averages this gradient over long periods of time.
        (1 month to the length of the mission).
1. Review existing QA Test Scripts and Test Suites. Coordinate new scripts and suites for new functionality
   with other IDL programmers. **Awaiting feedback from people.**
1. v4.0 QA testing
1. VMO Deliverables: data product description files **(discuss if only L2 data goes to VMO)**
  a. Review FGM SPASE numerical data and instrument files for all probes - Initial review completed.
     Will revisit to confirm correctness.
  b. Review Ephemeris SPASE numerical data instrument files for all probes - Initial review completed.
     Will revisit to confirm correctness.
  c. Draft of the esa numerical data file, the esa instrument file, and a person file for James Mcfadden.
    The two esa files are for themis A, but I think because the other spacecraft datatypes are very similiar it will
     be easy to generate the other spacecraft after the first. **Awaiting feedback of draft ESA** file sent to
     GSFC VMO for Probe 'A'. Then generate one file per probe.
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  d. Review Observatory files for all probes and the person file for Themis.
  e 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.
  f Generate an instrument file for EFI or SCM and corresponding numerical data files for each probe.
  g. *Cease doing VMO for a bit.*
2. IDL v7.0 - April when Release 4.0 of the Themis Software is QA'd. **Installed?**
2. Mini language to operate on tplot variables - first provide concept write up
3. boundary normal coordinates. On Hold. BugzID=59.
3. 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~~ **Send David the 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 it's 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

     VMO Product Status:
     Completed: FGM, State, ESA (draft - one probe)
     Yet to be done: MOM, FIT (onboard), FBK, SST, GMAG, FFT (onboard), SCM, EFI, ASI

<u>Bryan</u>
1. Improve speed of angle bin rotation in thm_part_moments2. 3/24
2. Allow user to specify phi, theta, pitch, gyrophase angles for pitch/gyrophase spectra. 3/25
3. 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.
   Due date to be determined after consult with Vassilis.
3. ~~Add ability to convert to GSM coordinates (requested by Kaori)~~ **Removed - not necessary.**
4. 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)
   Due date to be determined after consult with Vassilis.
5. Updates to QA Test Scripts and Test Suites.
5. v4.0 QA Testing

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4. 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)
4. 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. Multiple enhancements concerning keywords, valid_names and thm_load routines

<u>Michael</u>

1. Develop a prototype version of the EFI calibration (gain, offset, and despinning) algorithm from Chris Cully's v.2 code. To become a subset of THM_CAL_EFI.PRO.
   a. ~~Incorporate subtraction/correction code into LOAD/CAL suite.~~
   b. Set DLIMITS.DATA_ATT.COORD_SYS bug.
2. Modify existing EFI calibration routines.
   h. Arrange a test on flatsat for EAC. **Low priority.**
   i. ~~Talk to J. B. about crib sheet and ask about when he is comfortable making the code public.~~
      Will complete 1.a. and then update crib. J. B. will check and OK release.
   j. Implement time-dependent EFI calibration parameters. **Awaiting John. B.'s request to start**.
3. Correlation and dynamic correlation code: include these 2 routines and make a wrapper that works with tplot variables (and possibly interpolation if necessary). Scientist - Vassilis, Peer Review - Jim M. and David
      a. ~~Get information from Jim Lewis who is the original author.~~
4. Updates to QA Test Scripts and Test Suites.
5. v4.0 QA Testing
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6. Build an informational widget.
   a) (From Jim M.) Break THM_UI_SHOW_DLIM.PRO out of THM_GUI.PRO to use as a stand-alone routine. - Make the name of the displayed sub-structure(s) a parameter. (low priority)

<u>Cindy</u>
1. Orientation with Themis Gui (Meet with Jim McTiernan)
2. Orientation with Splash Gui (Meet with Krishan)
3. GUI Mods to be included in v4.0 - **to be determined from list below.**
4. Updates to QA Test Scripts and Test Suites.
5. v4.0 QA Testing
6. Develop functionality of Splash into Themis Gui

GUI Mods to be Prioritized by Vassilis
Gui Mods - Mac (David Sibeck's machine from Ken)
     a. The time span entered on the main window should be the default time span for tplotting.
       Specifically, if you change the timespan on the main window, the tplot timespan is unchanged.
     b. tlimits does not work from the cursor when run from the GUI.. tlimits with the cursor works from the
       command line.
     c. when selecting data, L1 and L2 can be selected at the same time and the result was confusing. since
       the low-level commands can only load one or the other, the GUI interface should enforce the same
       restriction.
     d. the script output does not match the standard crib sheets: e.g. you don't see thm_load_fgm anywhere in
       the script. so you need a new document to describe to people how to modify scripts made with the
       GUI...or you need to change the GUI to follow the crib sheets...or just live with it..
Additional GUI Mods - Phase II
     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
Additional GUI Mods - Phase III
     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>Hithesh</u>
1. Moments triggering off of the density and pressure for the day side. - In progress
     ~~a. Write new routine to check Moment packet address~~
     ~~b. Test new routine on ETU for different Spin periods~~
     ~~c. Test if Ion density is calculated correctly~~
     ~~d. Use Logic Analyzer for troubleshooting when necessary~~
     e. Repeat test on Flatsat in progress
2. Setup for v5.0 of the FSW with all new patches to date.
   Send to David a list of the patches to be incoporated by 3/31.
3. Discuss with Peter the next set of tasks for the FSW training.
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4. Discuss any questions with Peter - ongoing

<u>Vladimir</u>
1. Solar Wind IDL. Make modular. Crib to be sent out for review before task is complete.

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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

<u>Davin</u>
1. Pressure calibration issue - factor of 100 difference between ps?f_density and ps_m_density for all probes.
1. thm_load_sst issue - update the code when data not available. Jim M to email date and probe.
3. Sun Pulse Contamination not removed.
4. Calibration of 'D' and 'E' extra 10-30% ESA MOM's.
5. SST Attenuator - ???

<u>Vassilis</u>
1. Check out Outlier routine, LMN and Solar Wind crib and code from Vladimir.
2 get_sw_data.pro routine from Vladimir

<u>Harald</u>
1. Validate Tsygenko work from Pat (March 2008)

<u>Andreas</u>
1. L2 File Definitions Document - awaiting L1 document to be completed to use as template.

<u>UCLA</u>
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.

   a. Themis data are correctly interfaced with the CL software which is now performing similar plots as tdas products, for both ESA and SST sensors. We're currently analyzing different data collection period and cross-checking with the tdas results in order to fully validate CL reliability.

   b. We're also analyzing the pertinence of the particle measurements together with the spacecraft potential that is done within the L2 CDF files. We'll let you know about these exams.

   c. In middle terms, we plan to study the combination of both SST and ESA data for -maybe- producing data or visualization products using both instrument. Vassilis made us aware that similar effort is underway on your side. We will communicate with you when it will be started.

2. L1 ESA CDF and thm_load_esa

   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.

   2-a and 2-b. We're still iterating over the skeleton of the L1 ESA CDF data file, and hope to converge sooner (we're waiting for the Jim's feedbacks after delivering a new version of skeleton).

   c) Develop the code assigned to create and read L1 ESA cdf files. 3-4 weeks should be sufficient.

   2-c. This task is in wait of the validation of the skeleton. Reading code will be written right after getting confirmation of the content of the skeleton. We hope to clear up some of these tasks status.

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

1. TBD - Tplot User's Guide

2. TBD - executable crib for standardized themis mapping ala plot below. thm_map_crib.pro
     Keywords[default]:trange[timespan],centerMLT[6:30],centerLAT[65deg],
     equatorial[0],neutral[0],probe['all'],gmags['all'],model['t89'],input=[2(kp=2)],fieldlines[1]
     Note:equatorial also shows equatorial trace, neutral also finds and plots neutral sheet

3. TBD - Show mosaics with a fourth web button. [Right now nobody knows about them]. Clearly identify that "hour" click brings out mosaic. Add "5minute" feature to advance backward/forward. Fix buttons so that they are clear and not jumbled.

4. TBD - 2hr plots: fitmoms, and overviews [Note: people are using the DARTs site because of this feature; this small fix will make the main site more friendly].

5. TBD - fix "makeps". Attached is a "fixed" version which plots what user sees on screen without much reshaping. This is good for publications.

6. TBD - print, dprint, msg continue, verbose options for a standard

7. TBD - Mini Language to operate on tplot variables

8. TBD - Tplot FAQ's (Amanda) Maybe replaced by #1

9. TBD - Test Suite to test despin - from Science Team

10. 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)

11. TBD - File Tracker - the need for duplication?

12. TBD - Mull over: Allow Tplot: overplot color spectra, multiple angles, variable angles.

Accomplishments and Enhancements

1. March 1 was actually a major milestone for the GBO ASI. It was the first day that all 20 GBO were running and transmitting real-time data. The March displays are being reprocessed with the updated display of YKNF instead of EKAT.

2. A process which mirrors the 1m mag and swepam ACE data, and will also archive what's there. See the following link: http://themis.ssl.berkeley.edu/beta/ace.shtml .