



THEMIS User's Guide: Software Web Interface

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Distribution List

See: <http://themis.ssl.berkeley.edu/team.shtml>



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(Ctrl+Click page # to follow link)

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1. Introduction

1.1 Purpose and Scope.

The purpose of this document is to present to the worldwide scientific community the available tools for viewing, downloading, processing, calibrating and plotting THEMIS data and how to use these tools.

1.2 Supplementary Documents.

Various supplementary documents can be found on the THEMIS website. These include but are not limited to documentation for:

- Coordinate Systems
- Time Conventions
- Instrument Calibration
- Data Calibration and Processing
- Variable Naming (for data products)
- Software Documentation (including this user's guide)

These documents may be accessed from the THEMIS home page by selecting **Documentation** under the **Software** menu.

<http://themis.ssl.berkeley.edu/index.shtml>

They may also be accessed directly via the link below:

<ftp://apollo.ssl.berkeley.edu/pub/THEMIS/3%20Ground%20Systems/3.2%20Science%20Operations/Science%20Operations%20Documents/>



2. THEMIS Web Page Interface

2.1 THEMIS Web Site - Home Page

The THEMIS Home Web Page can be displayed by using the following URL: <http://themis.ssl.berkeley.edu/>. Across the top portion of this web page are a series of drop down menus (Home, The Mission, Data, Software, Publications, News & Events, Contact Us and For the Public). In this document we will be discussing the Data, Software and Contact Us Web Pages.

The THEMIS Data Drop Down Menu allows you to select the following options: *Overview, Data Policy/Credits, Summary Plots, Data Retrieval, Data Descriptions, Data Products, Event List, Data Processing and Collaboration Tools*. These options will be discussed in more detail in Section 0.

The THEMIS Software Drop Down Menu allows you to Select the following options: *Software, Documentation, Developers and Enhancements*. These options will be discussed in more detail in Section 2.3.

The THEMIS Contact Us automatically links you to a web page that allows you to send email to the THEMIS PI or THEMIS Instrument Scientists or send a Help Request to the THEMIS Science Support Team with Comments, Observations, Problems or Questions concerning data, a document, download, GUI, Plot, Software, Web Interface or any other issue not listed. This Help Request option will be discussed in more detail in Section 2.4.

Please note: Differences between the screen displays presented in this document and what you may see online are due to Web Page Upgrades not yet reflected in this document. The screen displays incorporated into this document are to give the reader a sense of the functionality of the Web Interface to THEMIS Science Software. Please see copy of the THEMIS Home Web Page on the Next Page.





THEMIS

Time History of Events and Macroscale Interactions During Substorms

ARTEMIS

Acceleration Reconnection Turbulence & Electrodynamics of Moon's Interaction with the Sun



[Home](#) [The Mission](#) [Data](#) [Software](#) [Publications](#) [News & Events](#) [Contact Us](#) [For the Public >>](#)

Stage 18
Radiation Belt Science (Dawn)
1/6/12-4/12/12 ▲

Stage 17
Dayside Science
9/30/11-1/5/12

Stage 16
Radiation Belt Science (Dusk)
6/23/11-9/29/11

Stage 15
Tail Science
3/16/11-6/22/11

Stage 14
Radiation Belt Science (Dawn)
12/09/10-3/15/11

Welcome to THEMIS.

The THEMIS mission: Resolving the mystery of where, when, and how auroral eruptions start... learn more >>

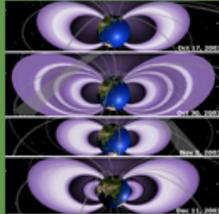
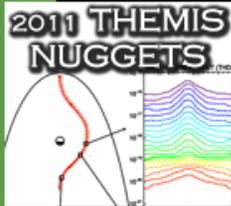
Are you a member of the public? Visit the [Education and Public Outreach site](#) for learning resources and information.

LATEST NEWS & EVENTS

January 29, 2012

Congratulations to Drew Turner for his Nature Physics publication on: "Explaining sudden losses of outer radiation belt electrons during geomagnetic storms" published on-line on January 29 and making the news around the world today!

...more news >>

Credit: NASA/Goddard SVS

View current orbital configuration >>





Figure 2.1a THEMIS Web Site - Home Page



2.2 THEMIS Data Web Pages

The THEMIS Data Drop Down Menu has the following options.

- *Overview* - A Data Overview and convenient location to Instruments, Orbits, Data Descriptions and more.
- *Data Policy/Credits* - displays the Rules for using the THEMIS Data website (Rules of the Road).
- *Summary Plots* which will allow you to look at Summary Plots of one Probe, Multiple Probes, Ground Magnetometer, All Sky Imager or Orbits Data. *Download Data* to Download THEMIS Data.
- *Data Retrieval* - Menu of the following options:
 - Data Files All* -ftp site of all THEMIS data directories and data files
 - Data Files By Platform* - allows selection to either a probe, gmag or flatsat data files
 - Data Files By Group* - allows selection by Probe and Instrument
- *Data Descriptions* - which will lead you to the documentation ftp site where the 'Science Data Variable Descriptions' document can be found.
- *Data Products* – which has descriptions of Level 2 data products, and status of the data products.
- *Event List* which will display the Events ftp site.
- *Data Processing* – containing descriptions of the data processing and status of the data processing.
- *Collaboration Tools* – Menu of the following options:
 - SSCWeb 3-D Orbit Viewer* – NASA GSFC Plots of orbital position in 3-D.
 - CDAWeb* – NASA SPDF Data Access page.
 - THEMIS Wiki Pages* – Useful THEMIS information in Wiki format.
 - Magnetopause Crossing Database* – CDAWeb plots of data for Magnetopause crossings.

Please note: If using THEMIS Science Software Data Analysis Tools there is no need to use the Data Retrieval - Data Files By Group Option. Please see screen displays below for all options.



THEMIS
Time History of Events and Macroscale Interactions During Substorms

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1/6/12-4/12/12

Stage 17
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Stage 16
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Stage 15
Tail Science
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Stage 14
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Data Products
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Collaboration Tools

LATE

March 11, 2011

THEMIS data were prominently presented at the recent AGU Chapman Conference, *Relationship between Auroral Phenomenology and Magnetospheric Processes*, held in Fairbanks, Alaska. As luck would have it, many participants were able to witness extraordinary auroral displays in person for the first time..

[...more news >>](#)

This photo of the aurora was taken at the Poker Flat Research Range during the conference, featured on Spaceweather.com

Credit: James Spann

2008 THEMIS NUGGETS

[View current orbital configuration >>](#)

Are you a member of the public? Visit the [Education and Public Outreach site](#) for learning resources and information.

Figure 2.2a THEMIS Data Dropdown Menu





THEMIS
Time History of Events and Macroscale Interactions During Substorms



ARTEMIS
Acceleration Reconnection Turbulence & Electrodynamics of Moon's Interaction with the Sun

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Data Processing Status

SSCWeb 3-D Orbit Viewer

CDAWeb

THEMIS Wiki Pages

Magnetopause Crossing Database

Data Policy and Credits

1. Data are free for scientific publications.
2. Register your submitted and accepted paper in the on-line form: <http://themis.ssl.berkeley.edu/publications>
3. We strongly recommend working directly or checking with the PI and instrument coIs regarding data interpretation, especially in the initial phase of the project, and well in advance to submitting a talk/publication, in order to be informed of the nuances (and accuracy) of the THEMIS dataset.
4. If PI/coIs are not part of the publication list, then Credit/Acknowledge the THEMIS team and NASA as follows:

" We acknowledge NASA contract NASS-02099 and V. Angelopoulos for use of data from the THEMIS Mission. Specifically: "

and for specific instruments the following additions:

for EFI: " J. W. Bonnell and F. S. Mozer for use of EFI data"

for SST: " D. Larson and R. P. Lin for use of SST data"

for ESA: " C. W. Carlson and J. P. McFadden for use of ESA data"

for SCM: " A. Roux and O. LeContel for use of SCM data"

for FGM: " K. H. Glassmeier, U. Auster and W. Baumjohann for the use of FGM data provided under the lead of the Technical University of Braunschweig and with financial support through the German Ministry for Economy and Technology and the German Center for Aviation and Space (DLR) under contract 50 OC 0302"

for GBO/ASIs: "S. Mende and E. Donovan for use of the ASI data, and the CSA for logistical support in fielding and data retrieval from the GBO stations"

for GBO/GMAGs (UCLA magnetometers): "S. Mende and C. T. Russell for use of the GMAG data"

for GBO/GMAGs (Alberta magnetometers): "I.R. Mann, D.K. Milling and the rest of the CARISMA team for use of GMAG data. CARISMA is operated by the University of Alberta, funded by the Canadian Space Agency." [see also [CARISMA Data Use Requirements](#)]

for GBO/GMAGs (Athabasca magnetometers): "Martin Connors and C.T. Russell for use of the GMAG data"

for GMAGs (MAGCS magnetometers): "'Erik Steinmetz, Augsburg College for the use of GMAG data'"

for GBO/GMAGs (Greenland magnetometers): "Tromsø Geophysical Observatory, University of Tromsø, Norway for use of the Greenland & Norway magnetometer data"

for GMAGs (Alaska magnetometers): "Data provided by the Geophysical Institute Magnetometer Array operated by the Geophysical Institute, University of Alaska. More information about this dataset is available at <http://magnet.asf.alaska.edu/>."

for GBO/GMAGs (Geological Survey of Sweden magnetometers (ABK)): "Geological Survey of Sweden, and INTERMAGNET for providing the data and promoting high standards of magnetic observatory practice."

for GBO/GMAGs (US Geological Survey magnetometers (BRW)): " Original data provided by the USGS Geomagnetism Program (<http://geomag.usgs.gov>)."

for GBO/GMAGs (Geological Survey of Canada magnetometers): "The Canadian Magnetic Observatory Network (CANMON), maintained and operated by the Geological Survey of Canada, provided the data used in this study(<http://www.geomag.nrcan.gc.ca>)."

◆ Useful Links:

- ◊ [Heliophysics Data Policy](#)

Figure 2.2b THEMIS Data Usage Rules Web Page

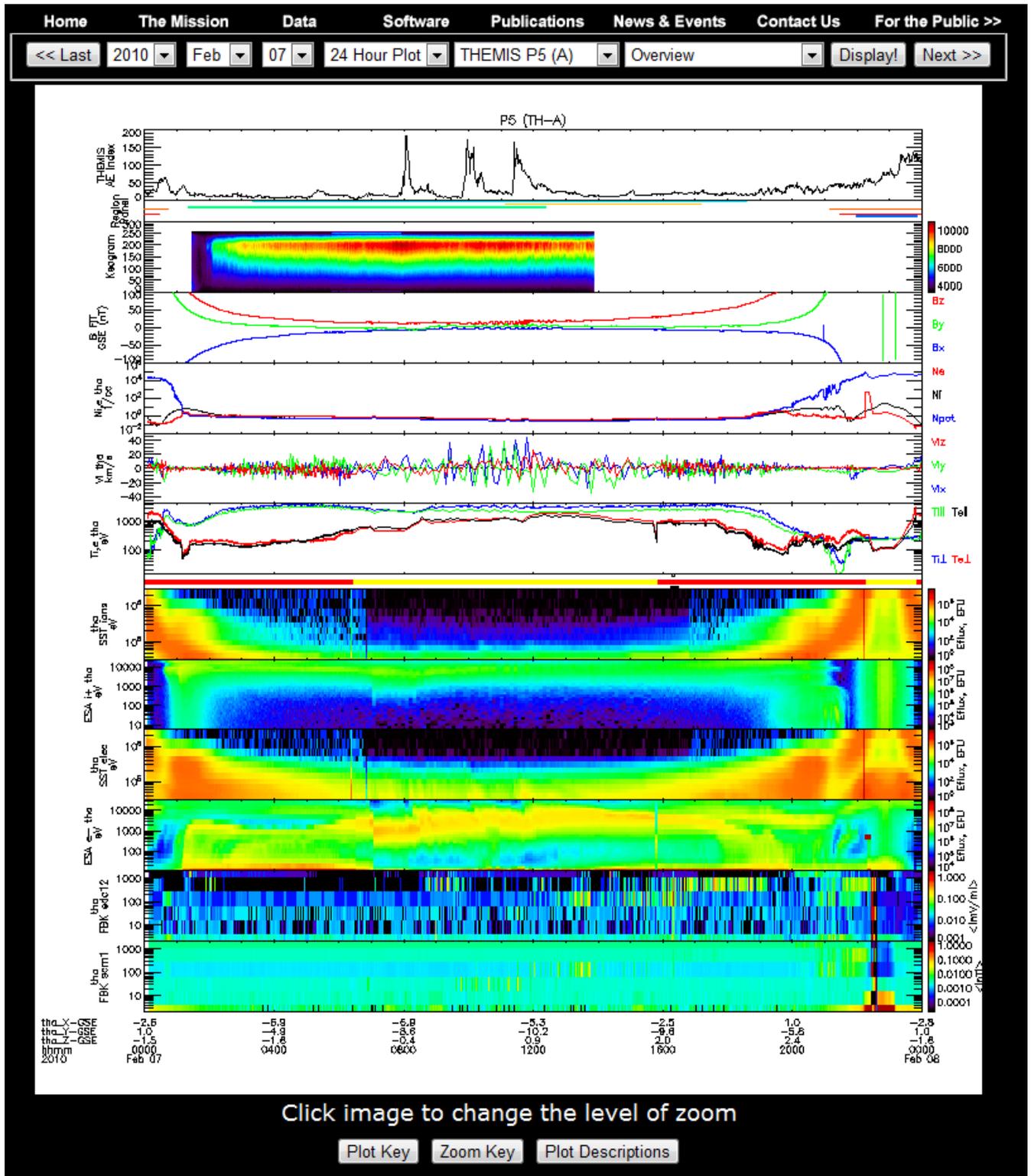


Figure 2.2c THEMIS Data Summary Plot Web Page

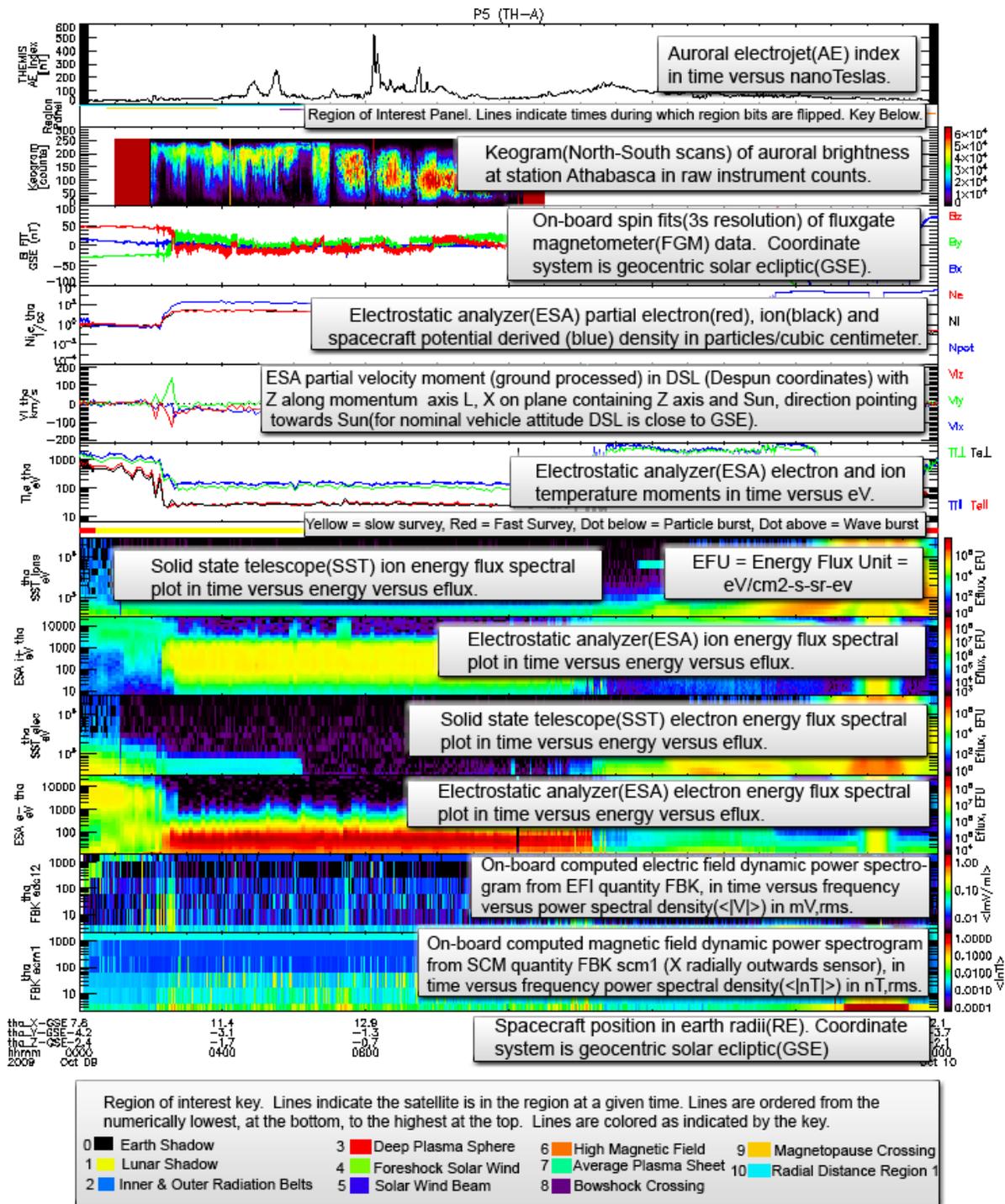


Figure 2.2d THEMIS Summary Web Page - View Plot Key Button



THEMIS Online Summary Plot Descriptions.

Found at: <http://themis.ssl.berkeley.edu/summary.shtml?autoload=1>

Plot Type/Name	Description	Observatories	Time Intervals
Overview ¹	General snapshot of THEMIS spacecraft instruments and ground data.	Single Spacecraft ² Selected ASI site. Aggregated GMAGs ³	24hr,6 hr,2 hr
Space ESA moments.	Electron/Ion velocity, pressure, field aligned temperature vector, and energy eflux. ⁴ Values derived from high resolution ESA data on spacecraft before down sampling for transmission	Single Spacecraft.	24hr,6 hr,2 hr
Ground ESA moments.	Electron/Ion velocity, pressure, field aligned temperature vector, and energy eflux. ⁵ Values derived from ESA reduced ⁶ distribution during ground processing.	Single Spacecraft	24 hr,6 hr,2 hr
ESA burst	Electron/Ion energy eflux spectrograms derived from ESA burst ⁷ distribution during ground processing and spacecraft mode indicator plots.	All Spacecraft	24 hr,6 hr,2 hr
ESA Full	Electron/Ion energy eflux spectrograms derived from ESA full ⁸ distribution during ground processing and spacecraft mode indicator plots.	All Spacecraft	24 hr,6 hr, 2 hr
ESA Reduced	Electron/Ion energy eflux spectrograms derived from ESA reduced distribution during ground processing and spacecraft mode indicator plots.	All Spacecraft	24 hr, 6 hr, 2 hr
SST Full	Electron/Ion energy eflux spectrograms derived from SST full ⁹ distribution during ground processing and spacecraft mode indicator plots.	All Spacecraft	24 hr, 6 hr, 2 hr

1. Detailed description at <http://themis.ssl.berkeley.edu/key.png>
2. All single spacecraft plots are available for all THEMIS spacecraft when data is available, but displayed on separate plots.
3. Aggregated using an algorithm like AE-index, but using THEMIS gmags rather than standard AE ground stations.
4. Also for reference $E = -V \times B$, spacecraft measured spin resolution magnetic field, and t89 model predicted magnetic field.
5. Also for reference $E = -V \times B$, spacecraft measured spin resolution magnetic field, and t89 model predicted magnetic field.
6. ESA Reduced distribution has high temporal (~3 second) resolution but low angle (1-6 bins) resolution.
7. ESA Burst distribution has high temporal (~3 second) and high angle (88 bins) resolution but limited availability.
8. ESA Full distribution has low temporal (~395/~98 seconds) and high angle (88 bins) resolution.
9. SST Full distribution has low temporal and high angle(128 bins) resolution.



SST Reduced	Electron/Ion energy eflux spectrograms derived from SST reduced ¹⁰ distribution during ground processing and spacecraft mode indicator plots.	All Spacecraft	24 hr, 6 hr, 2 hr
FGM	Fluxgate Magnetometer FGS ¹¹ and FGL ¹² data. Spacecraft mode indicator plots.	All Spacecraft	24 hr, 6 hr, 2 hr
Burst Memory	Burst memory segment fill level.	All Spacecraft	24 hr, 6 hr, 2 hr
Survey Memory	Survey memory segment fill level.	All Spacecraft	24 hr, 6 hr, 2 hr
GMAG High-H	Stacked plot of H component of HDZ ground magnetometer readings.	High Latitude THEMIS-GBO sites.	24 hr
GMAG High-D	Stacked plot of D component of HDZ ground magnetometer readings.	High Latitude THEMIS-GBO sites.	24 hr
GMAG High-Z	Stacked plot of Z component of HDZ ground magnetometer readings.	High Latitude GBO sites.	24 hr
GMAG Low-H	Stacked plot of H component of HDZ ground magnetometer readings.	Low Latitude GBO sites.	24 hr
GMAG Low-D	Stacked plot of D component of HDZ ground magnetometer readings.	Low Latitude GBO sites.	24 hr
GMAG Low-Z	Stacked plot of Z component of HDZ ground magnetometer readings.	Low Latitude GBO sites.	24 hr
ASI-Summary ¹³	Interactive grid of station versus hour/minute/second ASI thumbnails.	20 THEMIS ASI sites.	1 hr/1 minute/3 second.
ASI-Keograms	Interactive grid of station versus hour ASI Keograms.	20 THEMIS ASI sites.	1 hr
ASI-Averages	Interactive grid of station versus hour ASI averages.	20 THEMIS ASI sites.	1 hr
ASI-Mosaic	Map showing ASI station mosaic overlaid on map.	20 THEMIS ASI sites.	3 second.
Orbits-GSM	3 plots of THEMIS orbits over X/Y/Z axis of GSM coordinates, in an earth centered frame and 40 Re range in each dimension.	All Spacecraft	24 hr/6 hr

10. SST Reduced distribution has high temporal (~3 second) and low angle (1-6 bins) resolution.

11. FGS data is at spin resolution (~3 second) and is continuously available for most of the mission.

12. FGL data is at 1/4 second resolution and is available during configured regions.

13. Map indicating ASI site locations and field of view provided for reference.



Orbits-GSE	3 plots of THEMIS orbits over X/Y/Z axis of GSE coordinates, in a moon centered frame and 120 Re range in each dimension.	All Spacecraft	24 hr/6 hr
Ground Tracks North	Plot of THEMIS footprints on map of northern polar region. Generated by tracing field lines from spacecraft position to the north using the T89 model.	All Spacecraft	24 hr/6 hr
Ground Tracks South	Plot of THEMIS footprints on map of southern polar region. Generated by tracing field lines from spacecraft position to the south using the T89 model.	All Spacecraft	24 hr/6 hr



Index of /data/themis

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
Parent Directory		-	
FAST Images/	04-Feb-2009 12:04	-	
LZP/	03-May-2007 09:53	-	
backup_apr16/	16-Apr-2008 16:36	-	
bad_files	21-Mar-2008 17:29	48K	
bfds/	26-Mar-2007 11:27	-	
cronwatch/	10-Jul-2008 10:18	-	
despike_preserve/	08-Jul-2008 15:11	-	
ephem/	16-Jul-2008 17:16	-	
events/	27-Jan-2009 22:08	-	
idl_ctables/	30-Jul-2007 23:27	-	
incoming/	21-Nov-2008 15:30	-	
index.html.091508	08-Aug-2008 16:27	1.3K	
int_rebuild_7feb07/	03-Feb-2007 05:35	-	
10/	03-Apr-2008 16:54	-	
11_reprocess_backup_20081020/	20-Oct-2008 20:26	-	
12_offline/	25-Apr-2008 12:16	-	
moc/	09-Apr-2007 16:59	-	
nios/	05-Mar-2007 10:55	-	
old_production/	09-Jun-2008 10:39	-	
overplots/	31-Dec-2008 23:43	-	
process_logs/	04-Feb-2009 13:38	-	
ga/	16-Jul-2008 11:55	-	

Figure 2.2e THEMIS Data Retrieval - ALL



THEMIS Time History of Events and Macroscale Interactions During Substorms

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THEMIS Data Files by Platform

Which set of data files would you like to access?

Probes: [P5 \(A\)](#) [P1 \(B\)](#) [P2 \(C\)](#) [P3 \(D\)](#) [P4 \(E\)](#)

[Flatstat \(Satellite Simulator Data\)](#)

[Ground Station Data](#) (ground mags, all-sky imagers, and keograms)

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Data Variable Descriptions

Figure 2.2f THEMIS Data Retrieval - By Platform

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Data Files by Group

Reminder: If you are using the Themis Science Software there is no need to use this downloader.

Data Selection Criteria (please limit to 1 day for Mosaic Movies, 3 hours for High Res. ASI, 10 days for all other):

Segment: Space | Probe/GB0: THEMIS A (P5) | Instrument: Electric Field Instrument | Product: Level 1 CDF

From: mm/dd/yyyy To: mm/dd/yyyy [Download Data](#)

Check Data Availability

	Level 1 CDF	Level 2 CDF	Mosaics
Space Probe	YES	YES	N/A
Ground ASI			
Hi-Res	Lo-Res		
YES	YES		

NO YES Ground MAG NO [YES](#) N/A

Data FAQ

L1 data is raw, uncalibrated data in CDF format.
L2 data is calibrated data in physical units, also in CDF format.
Ground ASI Mosaic Movies are in MPG format.
L1/L2 CDF files are 1 day in duration, ASI Mosaics are 10 minutes

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CDAWeb
THEMIS Wiki Pages
Magnetopause Crossing Database

Figure 2.2g THEMIS Data Retrieval - By Group



Selecting Data Descriptions will display this web page. Click on the instrument or data type you wish to see. Note links at the bottom of the web page.

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THEMIS Data Descriptions

Which set of data would you like to see info about:

[ESA](#) [SST](#) [EFI](#) [MOM](#) [SCM](#) [FGM](#) [FBK](#) [FFT](#) [FIT](#) [ASI](#) [GMAG](#) [STATE](#)

[THEMIS Level 2 ESA file info:](#)

Electrostatic Analyzer (ESA): The Level 2 (L2) file contains ground-processed electron and ion energy fluxes (ions: 5 eV to 25 keV; electrons: 6 eV to 30 keV) and moments (density, velocity, pressure, and temperature). The file includes FULL, REDUCED and BURST modes. FULL mode: high angular resolution, low (fe min) time resolution. REDUCED mode: degraded angular resolution, high (approx. 3 sec) time resolution. BURST mode: high angular resolution, high time resolution, but only short bursts of data. The ESA L2 values are calculated from Level 0 packet data. Note that files for dates before the boom deployment for each probe only contain the fluxes, and not the moments. Velocity moments are given in Despun Spacecraft (DSL), Geocentric Solar Eclipse (GSE) and Geocentric Solar Magnetospheric (GSM) coordinates.

[Link to the ESA Data Variable Descriptions](#) [Link to ESA Instrument Information](#)
[Link to the ESA Data Processing History](#) [Link to L2 ESA Data Quality Flags Description](#)

Figure 2.2h



Selecting GMAG on the Data Descriptions page will display information about the GMAG data, together with a list of available GMAG sites (partial list only shown below).

THEMIS Data Descriptions

Which set of data would you like to see info about:

[ESA](#)
[SST](#)
[EFI](#)
[MOM](#)
[SCM](#)
[FGM](#)
[FBK](#)
[FFT](#)
[FIT](#)
[ASI](#)
[GMAG](#)
[STATE](#)

THEMIS Level 2 GMAG file info:

Ground Magnetometer (GMAG) data: The Level 2 files include magnetic field data from 84 different sites across the northern hemisphere. There are 22 official THEMIS GMAG stations in the Northern United States and Canada. Ten of these systems are installed with the Ground-Based Observatory (GBO) systems for THEMIS. Twelve are installed in schools and are part of the THEMIS Education and Public Outreach (E/PO) program. These magnetometers, known as the E/PO magnetometers, are the exact same type of magnetometer as those built for the GBOs. These GMAGs measure the magnetic field with 0.01 nT resolution at 2 samples/second. Units are nanotesla. Also included in the L2 distribution are stations from the University of Alaska, the University of Alberta, the MACCS project at Augsburg College, the University of Athabasca, the Technical University of Denmark, the Tromsø Geophysical University in Norway, the US Geological Survey, the Geological Survey of Canada, and Geological Survey of Sweden (SGU).

[Link to the GMAG Data Variable Descriptions](#)
[Link to GMAG Instrument Information](#)

[Link to the GMAG Data Processing History](#)

List of THEMIS sites (with THEMIS acronyms used in filenames) and contacts:

- [THEMIS-GBOs/UCLA sites \(contact C. T. Russell, ctrussell@iqpp.ucla.edu\)](#)
 - chbg - Chibougamou, QC, Canada
 - gbay - Goose Bay, NL, Canada
 - inuv - Inuvik, NT, Canada
 - kapu - Kapuskasing, ON, Canada
 - kian - Kiana, AK
 - kuuj - Kuujuuaq, QC, Canada
 - mcgr - McGrath, AK
 - snap - Snap Lake, NT, Canada
 - tpas - The Pas, MB, Canada

Figure 2.2i



Clicking on Data Variable Descriptions will display the current Data Variables Description Documents on the ftp site

To view this FTP site in Windows Explorer, click **Page**, and then click **Open FTP Site in Windows Explorer**.

You are user #1 of 50 simultaneous users allowed.

[Up to higher level directory](#)

01/26/2010 12:57PM	Directory	Previous Versions
01/26/2010 12:54PM	11,289	THEMIS Science Data Variables Descriptions.pdf
01/26/2010 12:55PM	39,936	THEMIS Science Data Variables Descriptions.xls

Figure 2.2j



Selecting Data Products Descriptions will display this web page and then click on data product you wish to see. Note links at the bottom of the web page.

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THEMIS Data Products Descriptions

Which data products would you like to see info about?

[Level 2 CDF's](#) [Summary Plots](#) [ASI Keograms & Mosaics](#) [Other Services](#)

Level 2 THEMIS CDF files contain THEMIS calibrated data quantities in physical units. These data can be used by scientists directly; the instrumental details have been accounted for in the calibration process. Level 2 data files are stored in the permanent archive at UCB and are distributed to mirror sites and the SPDF. *Level 2 data files are created daily* using Level 1 data and calibration data and are updated and reprocessed when necessary. For example, updates in calibration data for a given instrument/time period will result in new Level 2 data files for that instrument and time period. Currently (as of June 2008), there are Level 2 files for ESA, SST, FBK, MOM, FIT (onboard), GMAG and FGM data. By December 2008, daily processing of EFI, FFT (onboard), STATE, and SCM Level 2 data files will commence. By the end of the mission there will be an L2 ASK cdf as well.

Users wishing to view L2 THEMIS data within the context of observations by other missions should employ <http://cdaweb.gsfc.nasa.gov/>. Users wishing to view THEMIS orbits within the context of other missions should employ <http://sscweb.gsfc.nasa.gov/>.

Figure 2.2k



Selecting Data Products Status will display this web page

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THEMIS Data (CDF) Status

Data	Status
EFI	L2 cdf files are available for all probes for the full mission.
ESA	L2 cdf files with omnidirectional energy spectrograms, ground-processed moments are available for all probes for the full mission.
FBK	L2 cdf files with on-board, digitally computed filter bank spectra forelectric (EFI) and magnetic (SCM) fields.
FFT	L2 cdf files with on-board FFT's of electric (EFI) and magnetic (SCM) fields.
FGM	L2 cdf files are available for all probes for the full mission.
FIT	L2 cdf files with spin-fit magnetic (FGM) and electric (EFI) fields are available for all probes for the full mission.
GMAG	L2 cdf files with ground magnetometer data from 41 stations are available.
MOM	L2 cdf files with ESA moment, (not SST moments) are available for all probes for the full mission.
SCM	L2 cdf files are available for all probes for the full mission.
SST	L2 cdf files with omnidirectional energy spectrograms are available for all probes for the full mission.
STATE	L1 cdf files contain position, attitude, sun pulse data for each probe.

Users wishing to view THEMIS L2 data within the context of observations by other missions should employ cdaweb.gsfc.nasa.gov.

Figure 2.21



Selecting Event List will display this web page

FTP directory /events/ at justice.ssl.berkeley.edu

To view this FTP site in Windows Explorer, click **Page**, and then click **Open FTP Site in Windows Explorer**.

You are user #1 of 50 simultaneous users allowed.

[Up to higher level directory](#)

01/27/2009 12:00AM	784,560	Cluster 1 GBO conjunctions 2006.log
01/27/2009 12:00AM	1,145,760	Cluster 1 GBO conjunctions 2007.log
01/27/2009 12:00AM	1,353,576	Cluster 1 GBO conjunctions 2008.log
01/27/2009 12:00AM	723,492	Cluster 3 GBO conjunctions 2006.log
01/27/2009 12:00AM	1,121,148	Cluster 3 GBO conjunctions 2007.log
01/27/2009 12:00AM	1,324,092	Cluster 3 GBO conjunctions 2008.log
01/21/2009 12:00AM	22,344	FAST-GBO conjunctions 2005 fall.log
01/21/2009 12:00AM	17,220	FAST-GBO conjunctions 2005 spring.log
01/02/2008 12:00AM	98,363	FAST-GBO conjunctions 2006 fall.log
01/02/2008 12:00AM	51,743	FAST-GBO conjunctions 2006 spring.log
01/02/2008 12:00AM	153,887	FAST-GBO conjunctions 2007 fall.log
01/02/2008 12:00AM	58,883	FAST-GBO conjunctions 2007 spring.log
01/13/2009 12:00AM	231,504	FAST-GBO conjunctions 2008 fall.log
10/10/2008 12:00AM	99,119	FAST-GBO conjunctions 2008 spring.log
01/12/2009 12:00AM	43,427	FAST-GBO conjunctions 2008 summer.log
12/26/2007 12:00AM	25,950	REIMEI themis-gbo conjunctions.txt
01/22/2009 12:00AM	2,104	THEMIS GBO Station List.txt
12/19/2007 12:00AM	30,247	THEMIS GBO Station Map-2008-02.gif
04/15/2008 12:00AM	30,234	THEMIS GBO Station Map-2008-03.gif
02/13/2009 12:00AM	29,855	THEMIS GBO Station Map-2009-01.gif
04/15/2008 12:00AM	55,990	THEMIS Substorm 2007-2008.log
04/27/2009 12:00AM	52,196	THEMIS Substorm 2008-2009.log
01/25/2010 03:13PM	11,386	THEMIS Substorm 2009-2010.log

Figure 2.2m THEMIS Event List - ftp site



Selecting Data Processing Descriptions will display this web page and then click on data processing description you wish to see.

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Overview
Data Policy/Credits
Summary Plots
Data Files - All
Data Files - By Platform
Data Files - By Group
Data Descriptions
Data Variable Descriptions
Data Products Descriptions
Data Products Status
Event List
Data Processing Descriptions >>
Data Processing Status
SSCWeb 3-D Orbit Viewer
CDAWeb
THEMIS Wiki Pages
Magnetopause Crossing

THEMIS Data Processing Descriptions

Which type of data processing would you like to see info about?

[Space-Based](#) [Ground-Based](#) [ASI](#) [GMAG](#) [Ephemeris](#)

Autonomous THEMIS Science Operations Center (SOC) scripts obtain scheduling information from the Mission Operations Center (MOC) and use this information to retrieve and validate space-based instrument raw data files produced during ground station probe contacts. Statistics produced during this process are stored in a MySQL database which is accessed by operations personnel for review. The raw data files are archived on a Redundant Array of Independent Disks (RAID) system for subsequent processing and are backed up onto CD-R media. Retrieval of raw data files triggers production of numerous data products. Initially, the raw data files are converted in Level 0 data files. This includes separating the data by packet Application Identifier (AppID) and archiving these data files on the RAID system, which gives initial low level access by basic data analysis software. The Level 0 files are then converted into Level 1 data files in Common Data Format (CDF). During Level 1 processing, the raw packets are decommutated into various data structures. All known anomalies are corrected during this phase of processing. L1 CDF's have all samples time stamped and the Mission Operations Center (MOC) routinely performs clock correlation tests, and sends clock update commands to keep timing errors below 0.5 sec across the constellation of probes. At this point the data is still raw and un-calibrated, but the CDF format allows wider access and is platform independent. Following creation of Level 1 data files, Level 2 data files are created. This includes calibrated data in physical units and is also in CDF format. Both Level 1 and Level 2 files are archived on the RAID system. Following reception of the raw ground station data files after a contact, the Level 0-2 processing is completed within 1 hour.

Figure 2.2n



Selecting Data Processing Status will display this web page

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THEMIS Data Processing Status

Probe Data Processing

File Recovery and Statistics

- BDPS Description
- BDPS Reports

Data Products

- Level 0 (L0) Latest VC->L0 Processing Results
- Level 0 (L0) Packet File Inventory
- Level 1 (L1) CDF File Inventory
- Level 2 (L2) CDF File Inventory
- Summary Plot Inventory

Ground Based Data Processing

- Magnetometers
 - ◊ GBO UCLA Latest
 - ◊ UAlberta (CARISMA) Latest
 - ◊ UAlaska (GIMA) Latest
 - ◊ EPO UCLA Latest
 - ◊ Athabasca (AUTUMN) Latest
 - ◊ Augsburg (MACCS) Latest
 - ◊ GMAG ASCII Files Latest
 - ◊ GMAG CDF Files Latest
 - ◊ Raw File Inventory
 - ◊ Level 2 (L2) CDF File Inventory
- All Sky Imagers
 - ◊ Realtime (Lowrate) Latest
 - ◊ Lowrate File Inventory
 - ◊ Highrate File Inventory
 - ◊ Level 1 (L1) CDF File Inventory - Keograms (ask)
 - ◊ Level 1 (L1) CDF File Inventory - Thumbnail (ast)
 - ◊ Level 1 (L1) CDF File Inventory - Full Resolution (asf)
 - ◊ Summary Data
 - Site Summaries
 - Site Summaries with Raw Data
 - Over, Avg, Keo, and orbit Summaries
- GBO Status Page at Calgary

Mission Operations Status Pages

- Probe Bus and Instrument Health
- Current Pass Support Schedule
- Sequence of Events

Tohban Links

- Main Tohban Webpage
- Tohban Reports

Sidebar Navigation:

- Overview
- Data
- Policy/ Credits
- Summary Plots
- Data Files - All
- Data Files - By Platform
- Data Files - By Group
- Data Descriptions
- Data Variable Descriptions
- Data Products Descriptions
- Data Products Status
- Event List
- Data Processing Descriptions
- Data Processing Status >>
- SSCWeb 3-D Orbit Viewer
- CDAWeb
- THEMIS Wiki Pages
- Magnetopause Crossing Database

Figure 2.2o



Selecting Collaboration tools will display this list of links

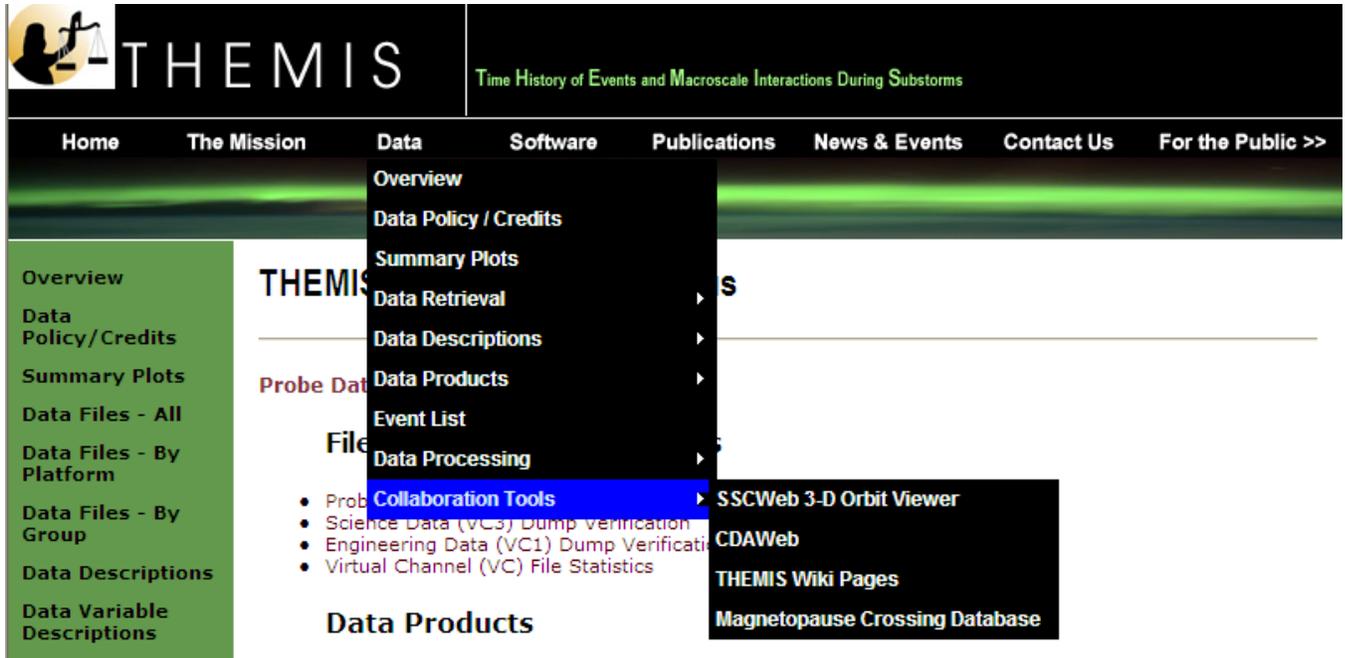


Figure 2.2p



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THEMIS Software

The THEMIS Data Analysis Software Suite consists of IDL routines which read data in CDF format, as well as other less refined data sets. IDL routines can be used to download, open, analyze, and plot Level 1 (L1) and Level 2 (L2) data quantities. They can also be used transform L1 data into L2 data. L1 data is raw, uncalibrated data in CDF format. L2 data is calibrated in physical units These IDL routines were derived from those used by the Cluster, Wind, Polar, and FAST missions. In addition to command line invoked IDL routines, the software provides a graphical user interface for opening, analyzing, and plotting data. This interface was designed to facilitate use of the most useful IDL routines.

To begin:

1. [Download](#) the latest release of the Software (TDAS Version 7.00, April 2012)
Download the [Quick Reference Guide](#) directly from this website as a [DOC](#) or [PDF](#).
Download the [THEMIS Software Web Interface Users' Guide](#) as a [DOC](#) or [PDF](#).
Download the [THEMIS Science Data Analysis Software \(TDAS\) Users' Guide](#) as a [DOC](#) or [PDF](#).
2. After downloading a version of the software and the user's guide, open up the users guide and follow the instructions provided.
3. You may also find the [HTML Docs](#) for the latest released version of the Software. You can also browse the IDL source.

Future Releases:

1. You can receive emails notifying you of New Software Releases by [Registering](#) on the THEMIS Science Support Distribution List.
2. [Download](#) not yet released future Software. Please Note this Software may not yet be fully tested and is not supported by the THEMIS Science Support Team.

IDL Geopack DLM:

To use the Tsyganenko Model extensions to the THEMIS software you need to [Download](#) and install the interface between Tsyganenko's Fortran code and IDL. This interface was developed and provided for THEMIS as a courtesy by Haje Korth. Installation instructions can be found [here](#).

For comments, observations, problems or questions about data access, software or web site content please contact the [Themis Science Support Team](#).

Figure 2.3b THEMIS Science Software Web Page



When you click on Download the latest release on a Windows machine A File Download dialogue box will be displayed. Click on 'Open' and the WinZip box will appear. Select the Extract icon to download the unzipped versions of the THEMIS Science Software to your computer. Notice the Extract display will ask you where to put the downloaded files. Please see Screen displays on this and the next page.

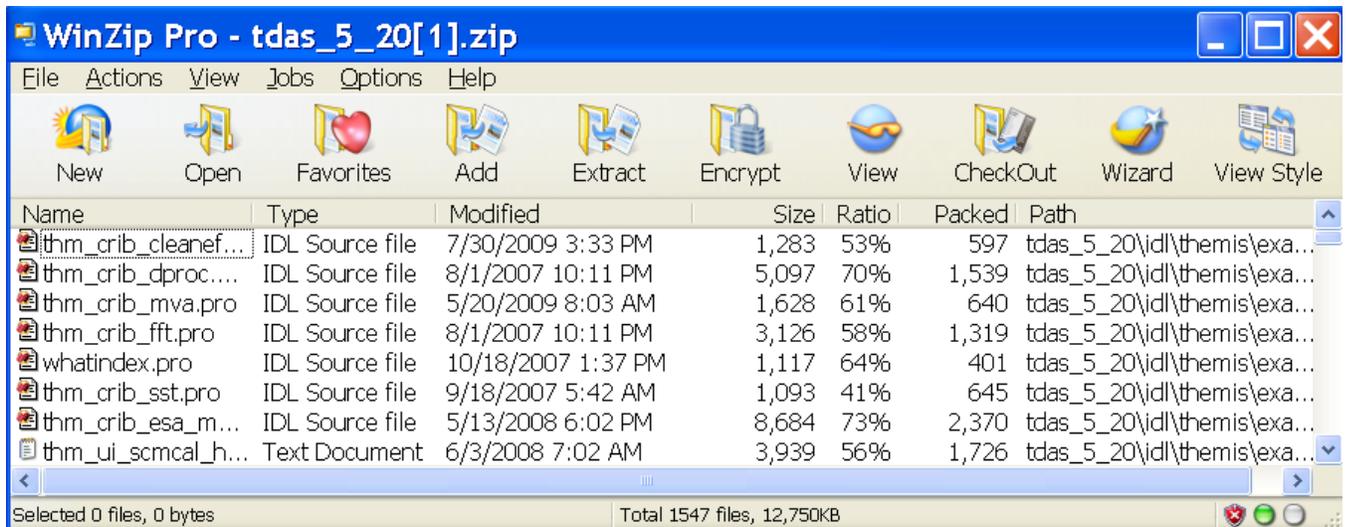
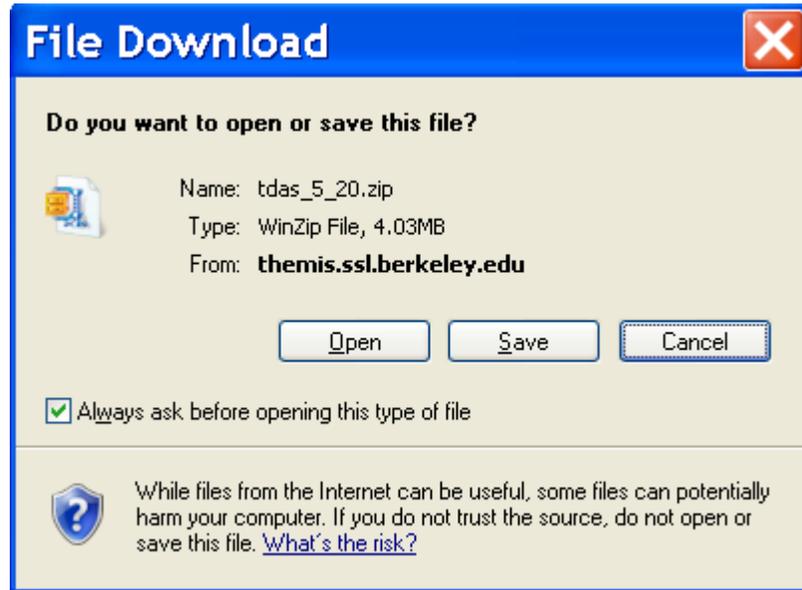


Figure 2.3c THEMIS Science Software - Download Software

Recommendation: put the Software where you can easily find it as you will need to set the IDL path.

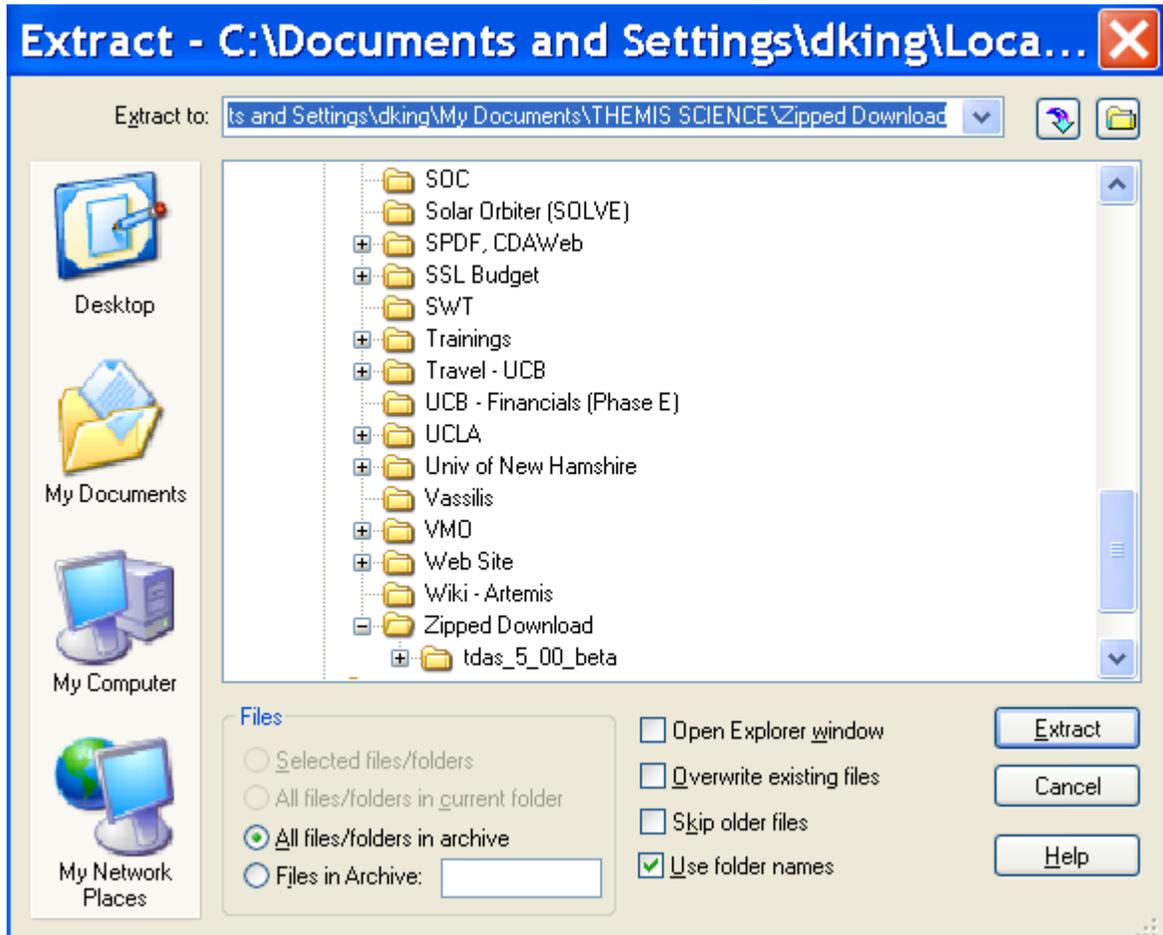


Figure 2.3d THEMIS Science Software - Download Software

The screenshot shows a Windows Internet Explorer browser window. The title bar reads "THEMIS SW Help for tdas_2_00qa_r1187_2007-07-19 - Windows Internet Explorer". The address bar shows the URL "http://themis.ssl.berkeley.edu/socware/tdas_2_00qa0/idl/_tdas_doc.html". The browser interface includes a menu bar (File, Edit, View, Favorites, Tools, Help), a search bar with the Google logo, and a toolbar with various icons. The main content area displays the page title "THEMIS SW Help for tdas_2_00qa_r1187_2007-07-19" in bold. Below the title, it states "This page was created by the IDL library routine mk_html_help2." and "Last modified: Fri Jul 20 01:17:09 2007." A horizontal line separates this text from a list of links: [3](#), [A](#), [B](#), [C](#), [D](#), [E](#), [F](#), [G](#), [H](#), [I](#), [J](#), [L](#), [M](#), [N](#), [O](#), [P](#), [R](#), [S](#), [T](#), [U](#), [V](#), [W](#), [X](#), [Y](#), [Z](#), [_](#). Another horizontal line follows. Below this is the section header "Directories Searched:" in bold. Underneath, there is a bulleted list of directory paths:

- [ssl_general/CDF](#)
- [ssl_general/cotrans](#)
- [ssl_general/davin/wind](#)
- [ssl_general/examples](#)
- [ssl_general/key_param](#)
- [ssl_general/misc](#)
- [ssl_general/misc/SSW](#)
- [ssl_general/misc/system](#)
- [ssl_general/science](#)
- [ssl_general/tools/fitting](#)
- [ssl_general/tools/misc](#)
- [ssl_general/tools/tplot](#)

Figure 2.3e THEMIS Science Software - HTML Docs

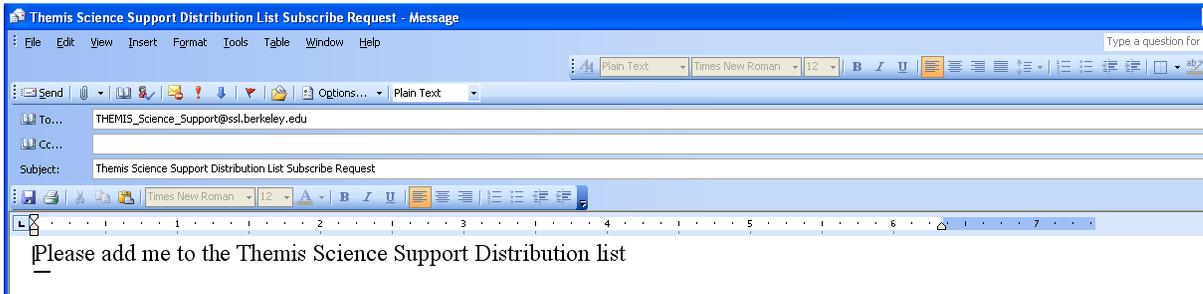


Figure 2.3f THEMIS Science Software - Registration for Notification

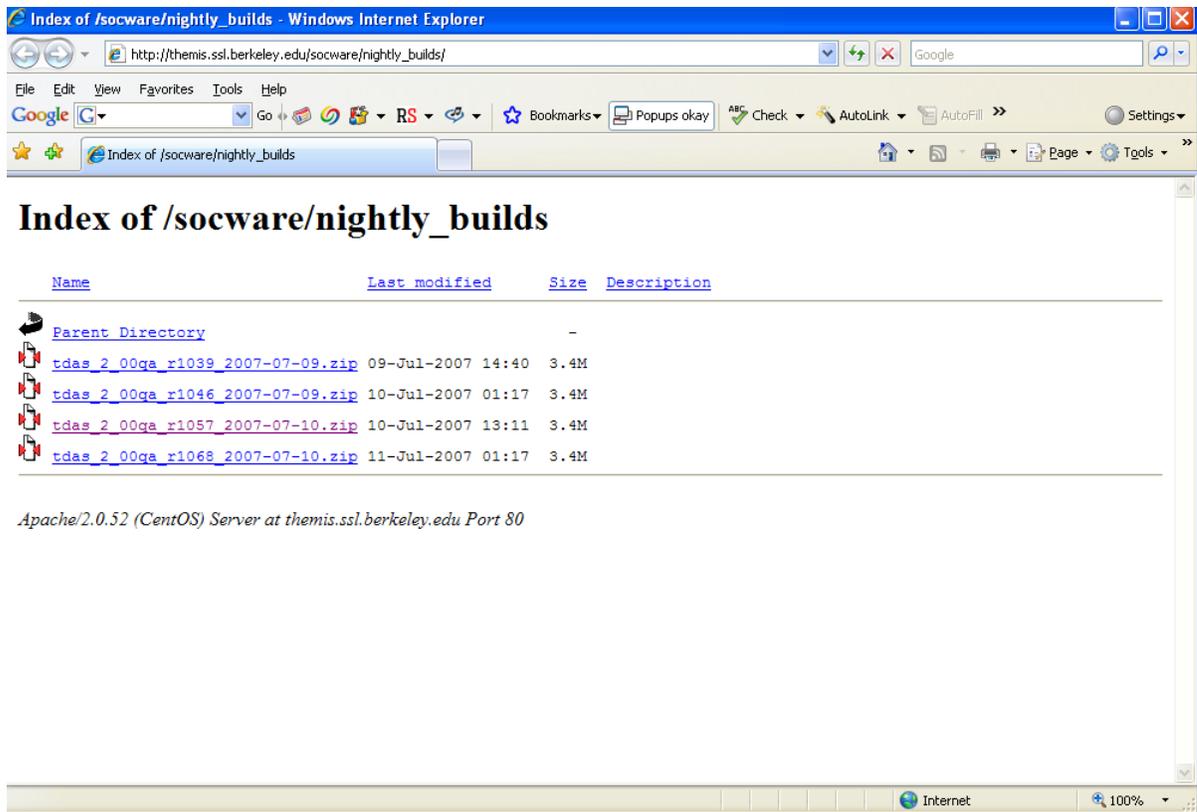


Figure 2.3g THEMIS Science Software - Download Not Yet Released Software



2.4 THEMIS Science Software - For Developers Web Page

The THEMIS Science Software for Developers Web Page has links to aid software developers in developing and contributing software to the THEMIS Science Software library. The 'Additional Documentation' option will link you to the ftp site where current THEMIS Science Software documentation can be found.

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THEMIS Software - For Developers

To work on development of Software for future releases, Developers of the Themis Data Analysis Suite can use Subversion (SVN) to get the latest version of the Software and commit their software changes. Below are links to the information you need on setting up and using SVN to develop and contribute software.

- [SVN Command Line Usage](#)
- [SVN GUI Usage](#)

Whether or not you're using SVN to develop code, follow the rules laid out in the Software Developers Guide.

- Software Developers' Guidelines: [DOC](#) or [PDF](#)
- THEMIS Software Web Interface User's Guide: [DOC](#) or [PDF](#)
- THEMIS Science Data Analysis Software User's Guide: [DOC](#) or [PDF](#)
- [Additional Documentation](#)

For comments, observations, problems or questions about data access, software or web site content please contact the [Themis Science Support Team](#).

Software
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Figure 2.4a THEMIS Software - For Developers Web Page



When you click on the Documentation Option on the THEMIS Software Dropdown menu you will be transferred to the THEMIS Document ftp site.

Index of ftp://apollo.ssl.berkeley.edu/pub/THEMIS/3 Ground Systems/3.2 Science Operations/Science Operations Documents/

[Up to higher level directory](#)

Name	Size	Last Modified
Science Data Variable Descriptions		1/26/2010 12:00:00 AM
Science Software Data Analysis Releases		1/13/2010 12:00:00 AM
Science Software Data Analysis Software Presentation - 200707		9/28/2007 12:00:00 AM
Science Software Data Analysis Software Presentation - 200712 GEM		12/7/2007 12:00:00 AM
Science Software Data Analysis Software Presentation - 200806 GEM		6/20/2008 12:00:00 AM
Science Software Data Analysis Software Presentation - 200809 SWT UNH		9/22/2008 12:00:00 AM
Science Software Data Analysis Software Presentation - 200812 GEM		12/11/2008 12:00:00 AM
Science Software Data Analysis Software Presentation - 201006 GEM		6/16/2010 12:00:00 AM
Science software Data Analysis Software Presentation - 200906 GEM		6/23/2009 12:00:00 AM
Science software Data Analysis Software Presentation - 200912 GEM		12/8/2009 12:00:00 AM
Software Developers Guide		5/24/2007 12:00:00 AM
Software Users Guides		3/22/2011 11:33:00 AM
Software Users Quick Reference Guides		3/22/2011 11:31:00 AM
SpinFits Documents		6/15/2007 12:00:00 AM
THEMIS - ARTEMIS Instrument Information Available on Web Pages		3/3/2010 12:00:00 AM
THEMIS Documentation Status Lists		2/26/2010 12:00:00 AM
THEMIS Science Parameters		3/3/2010 12:00:00 AM
THEMIS Science Software (TDAS) Release Enhancement Lists		3/21/2011 2:26:00 PM
THEMIS Summary Plot Description Tables		2/23/2010 12:00:00 AM
THEMIS Tips of the Month		4/7/2010 12:00:00 AM
THEMIS-ARTEMIS Administrators Guide		3/21/2011 2:51:00 PM
magstations.txt	5 KB	8/29/2008 12:00:00 AM
thm_ogs_431m_ephemeris_format_definition.doc	145 KB	4/24/2007 12:00:00 AM
thm_ogs_431m_ephemeris_format_definition.pdf	204 KB	6/15/2007 12:00:00 AM
thm_soc_101_TIME_20070120.doc	128 KB	6/15/2007 12:00:00 AM
thm_soc_101_TIME_20070120.pdf	226 KB	6/15/2007 12:00:00 AM
thm_soc_102_STATEFILE_20070420.doc	127 KB	6/15/2007 12:00:00 AM
thm_soc_102_STATEFILE_20070420.pdf	226 KB	6/15/2007 12:00:00 AM
thm_soc_103_HSK_VARNAMEs_20070129.doc	227 KB	6/15/2007 12:00:00 AM
thm_soc_103_HSK_VARNAMEs_20070129.pdf	351 KB	6/15/2007 12:00:00 AM
thm_soc_105_FIELDS_VARNAMEs_20060929.doc	172 KB	6/15/2007 12:00:00 AM
thm_soc_105_FIELDS_VARNAMEs_20060929.pdf	199 KB	6/15/2007 12:00:00 AM
thm_soc_106_PARTICLES_VARNAMEs_20061102.doc	115 KB	6/15/2007 12:00:00 AM
thm_soc_106_PARTICLES_VARNAMEs_20061102.pdf	149 KB	6/15/2007 12:00:00 AM
thm_soc_108_GMAG_L2_VARNAMEs_20060929.doc	535 KB	6/15/2007 12:00:00 AM
thm_soc_108_GMAG_L2_VARNAMEs_20060929.pdf	400 KB	6/15/2007 12:00:00 AM

Figure 2.4b THEMIS Documentation ftp site



2.5 THEMIS Contact Us Web Page

The THEMIS Contact Us Web Page lists the contact information for the THEMIS Principal Investigator as well as the Co-Investigators for each THEMIS Instrument. In addition there is an option to send a Help Request to the THEMIS Science Support Coordinator with comments, observations, problems or questions. The Help Request form and process will be explained in more detail in Section 3. Please see the screen display below.

THEMIS
Time History of Events and Macroscale Interactions During Substorms

Home The Mission Data Software Publications News & Events **Contact Us** For the Public >>

Contact Us >>
Help Request

Contact Us

For questions about the THEMIS mission:
Vassilis Angelopoulos (vassilis@ssl.berkeley.edu)

For questions about data from specific instruments, please contact the instrument leads below or the PI:

Vassilis Angelopoulos (vassilis@ssl.berkeley.edu)

Electric Field Instrument (EFI):
J. Bonnell (jbonnell@ssl.berkeley.edu) or F. Mozer (fmozer@ssl.berkeley.edu)

Search Coil Magnetometer (SCM):
A Roux (Alain.roux@cetp.ipsl.fr) or O. LeContel (Olivier.lecontel@cetp.ipsl.fr)

Flux Gate Magnetometer (FGM):
K. H. Glassmeier (kh.glassmeier@tu-braunschweig.de) or U. Auster (uli.auster@tu-braunschweig.de)

Electrostatic Analyzer (ESA):
C. W. Carlson (cwc@ssl.berkeley.edu) or J. P. McFadden (mcfadden@ssl.berkeley.edu)

Solid State Telescope (SST):
D. Larson (davin@ssl.berkeley.edu) or R. P. Lin (boblin@ssl.berkeley.edu)

Ground-Based Observatories/All Sky Imagers:
S. Mende (mende@ssl.berkeley.edu) or H. Frey (hfrey@ssl.berkeley.edu) or E. Donovan (eric@phys.ucalgary.ca)

Ground-Based Observatories/Ground Magnetometers:
C.T. Russell (ctrussell@igpp.ucla.edu) or I. Mann (imann@phys.alberta.ca)

For comments, observations, problems or questions about data access, software or web site content please contact the [Themis Science Support Team](#).

Figure 2.5 THEMIS Software Contact Us Web Page



3. THEMIS Science Support Help System

3.1 THEMIS Science Support Help Process

The THEMIS Science Support Help Process exists for users who have Comments, Observations, Problems or Questions concerning data, a document, download, GUI, Plot, Software, Web Interface or any other issue not listed. The Help Process is a bit different for [Step 1](#) if you are using the Web or the GUI Interface.

For the Web to Help Request Form Interface:

From either the Software or Contact Us Web Pages (example on previous page) the user will see the following:

For comments, observations, problems or questions about data access, software or web site content please contact the [THEMIS Science Support Team](#).

If you click on [THEMIS Science Support Team](#) a THEMIS Science Support Help Request Form (example in Section 3.2) will be displayed. The user fills out the form and hits 'Submit'. Depending on your computer and email application the processing will be different for the email to be sent. For some computers the form is sent automatically. If you have a PC running Windows a box asks you which email Application you use. If you use a desktop email application like Outlook, Outlook Express, select that button, hit OK and the Form will be automatically sent to the Support Coordinator. If you choose either of the two other options (Internet Email or Other) Windows will guide you through a three step process to send your email. Again, if not using windows (e.g. Mac, Linux or Unix) the process maybe different. Yet the main goal is for the Help Request Form to be sent to THEMIS_Science_Support@ssl.berkeley.edu.

For the GUI to the Help Request Form Interface:

If you select the "HELP" drop down menu on the THEMIS Science Software GUI Main window or if the GUI detects an error, a Help Request Form is displayed (see example in Section 3.3). Fill out the form and then click on 'Save'. (Be sure to save it somewhere you can find it.) If reporting a bug please save and send your history file. Do this by first selecting "History Window" on the "View" drop down menu and then clicking on "Save" at the bottom of the History window. We suggest that you put your Help Request Form and Saved History file in the same location. At this point you can address your email to [THEMIS Science Support Team](#), attach your Help Request Form and your History file and send.

The remaining steps are the same for either the Web or GUI Interface.

Step 2: User sends any additional information (logs, error messages, etc) to THEMIS_Science_Support@ssl.berkeley.edu.

Step 3: The Support Coordinator logs in your help request, and sends back an email confirming receipt of your help request with your Help Request Number. The Support Coordinator will also forward your Help Request and any attachments to the person (Actionee) who will investigate and answer your Help Request.

Step 4: The Actionee will contact the User to respond to the comment, observation, problem or question.

Step 5: Feel free at any time to send an email to the Support Coordinator requesting status of your request.



3.2 THEMIS Science Support Help Form - Web Form

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Contact Us
Help Request>>

THEMIS Science Help Request

Request Type:
 Comment Observation Problem Question

Category:
 Data Document Download Gui Instrument
 Plot Software Web Content Other Not Sure

Request Title:

Requestor Info:
Name: Office Phone:
Email:

Help Request Details
If Problem or Observation(Please fill in as completely as you can):
Date Occurred:
Operating System: (e.g. Linux,Unix,Windows)
CDF Version: (If known,otherwise leave blank)
Version of Software: (See Software download zip file name)
Version of IDL: (See IDL help button)

For all types, please include a detailed description below:
(If applicable, include IDL error messages, crib sheet or lines of code used to run, and the GUI history file)

Please email any supporting materials that would help in researching your request to:
Themis_Science_Support@ssl.berkeley.edu with the Help Request Title from above in the subject line.

Figure 3.2



3.3 THEMIS Science Support Help Form – GUI Interface

THEMIS: Help Request Form

THEMIS Science Help Request Form

thm_sci_help_request_XXXX (XXXX number will be sent back to you)

Date Submitted: _____

Request Type: __ (C-Comment, O-Observation, P-Problem, Q-Question)

Category: _____ (Data, Document, Download, Gui, Instrument, Plot, Software, Web Content, Other, Not Sure)

Title: _____

Requestor Info:
Name: _____ Office Phone: _____
Email: _____

Help Request Details (fill in as much as you can):

If a Problem or Observation:
Date Occurred: _____
Operating System _____ (e.g. Linux, Unix, Windows)
CDF Version ____ Version of Software ____ Version of IDL ____

Detail Description of Comment, Observation, Problem or Question:
(before starting a new GUI session, please also attach the GUI history file located here on your system:
C:\Users\philpott\thm_gui_running_history.txt
)

Please email any supportive materials that would help in researching your request to:THEMIS_Science_Support@ssl.berkeley.edu with the Help Request Title above in the subject line.

Save Close

Figure 3.3