

Taiwan Ascii and Idl_save Data Archives (AIDA) for THEMIS

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Outline

1. How to **download** ASCII and IDL SAVE files from Taiwan AIDA
2. How to **restore** a SAVE file on IDL
3. How to **plot** with an IDL SAVE file

Taiwan THEMIS Project

- Initiated by Dr. Frank Cheng
- Led by Dr. Jih-Hong Shue
- Financially supported by National Space Organization (NSPO)
- Data provided by the THEMIS team.
- One main project (data services) and three Science subprojects (data analysis and simulation)
- Taiwan AIDA is the major work of the main project.

Major THEMIS data providers

- **Official THEMIS** web page
<http://themis.ssl.berkeley.edu>
(CDF files, Plotting Software, and Summary Plots)
- **CDAWeb** web page
<http://cdaweb.gsfc.nasa.gov>
(ASCII and CDF files, Customized Plots)

THEMIS Data Format provided by Taiwan AIDA

- ASCII and IDL SAVE files for level-2 THEMIS data only.
- The ASCII files are good for people who do not have the IDL software.
- The IDL SAVE files are good for people who have known some basic IDL programming concepts and techniques and want better efficiency in data reading.

Taiwan AIDA Portal Web Page

http://themis.ss.ncu.edu.tw/e_data_download.php



The screenshot shows a Microsoft Internet Explorer browser window displaying the Taiwan AIDA Portal. The browser's address bar shows the URL http://themis.ss.ncu.edu.tw/e_data_download.php. The page content is as follows:

TAIWAN AIDA FOR THEMIS

Taiwan Ascii and Idl_save Data Archives (AIDA) for THEMIS

Taiwan Ascii and Idl_save Data Archives (AIDA) is developed for those who do not have the Interactive Data Language (IDL) data analysis and visualization software (for ASCII format) or those who know some basic IDL concepts and techniques and want more flexibilities in reading and plotting the THEMIS data (for IDL SAVE format).

The ASCII and SAVE files are converted using the original CDF files obtained from the web page of Space Science Laboratory, University of California, Berkeley. [The rules of the road for data use](#) can also be found there.

Taiwan AIDA, created and maintained by the Taiwan THEMIS space research team in Institute of Space Science, National Central University, is financially supported by [National Space Organization, Taiwan](#) under grant 95-NSPO(B)-SP-FA07-01, and [Ministry of Education under the Aim for Top University program at NCU](#). We acknowledge NASA contract NAS5-02099 and V. Angelopoulos for use of data from THEMIS mission.

After you download THEMIS data from this web site, the use of the data through Taiwan AIDA should be acknowledged in any publications. For example, **We acknowledge NASA contract NAS5-02099 and V. Angelopoulos for the use of data from the THEMIS Mission through AIDA at Institute of Space Science, National Central University in Taiwan.**

THEMIS Data Download

[Download ASCII files](#)

[Download IDL SAVE files](#)

[Data Search](#)

On the left side of the page, there is a vertical navigation menu with the following items:

- TAIWAN THEMIS Space Research Team
- Subproject 1
- Subproject 2
- Subproject 3
- Data Download**

THEMIS Data Download

- **Download ASCII files** (for multiple dates)
<http://themis.ss.ncu.edu.tw/data/THEMIS/ascii/>
- **Download IDL SAVE files** (for multiple dates)
<http://themis.ss.ncu.edu.tw/data/THEMIS/save/>
- **Data Search** (for a particular date)
http://themis.ss.ncu.edu.tw/cgi-bin/ion-p?page=e_data_download.ion

Data Search for a Particular Date

TAIWAN THEMIS
Time History of Events and Macroscale Interactions During Substorms

NSPO NASA

Data Search

Date	<input type="text"/> / <input type="text"/> / <input type="text"/> (Format : YYYY/MM/DD)		
Data Type	<input type="radio"/> ascii <input type="radio"/> IDL save		
Probe	<input type="checkbox"/> All <input type="checkbox"/> tha <input type="checkbox"/> thb <input type="checkbox"/> thc <input type="checkbox"/> thd <input type="checkbox"/> the		
Instrument	<input type="checkbox"/> All		
	ESA	FGM	SST
	<input type="checkbox"/> peif_plasma	<input type="checkbox"/> fgs	<input type="checkbox"/> psif_eflux
	<input type="checkbox"/> peif_eflux		<input type="checkbox"/> psef_eflux
	<input type="checkbox"/> peef_plasma		
	<input type="checkbox"/> peef_eflux		
	<input type="checkbox"/> peir_plasma	STATE	
	<input type="checkbox"/> peir_eflux	<input type="checkbox"/> pos	
<input type="checkbox"/> peer_plasma	<input type="checkbox"/> vel		
<input type="checkbox"/> peer_eflux			
E-mail	<input type="text"/>		
	<input type="button" value="Submit"/>		

Data Set
Please enter the date.

HOME TAIWAN THEMIS CONTACT US
THEMIS MISSION SITE NASA-THEMIS

APL Cal

開始 網際網路 下午 06:08

Example Output from Data Search

- tha_esa_peif_gsm_20080101.save 17K
- tha_esa_peif_eflux_20080101.save 76K
- tha_esa_peef_gsm_20080101.save 17K
- tha_esa_peef_eflux_20080101.save 76K
- tha_esa_peir_gsm_20080101.save 734K
- tha_esa_peir_eflux_20080101.save 3.7M
- tha_esa_peer_gsm_20080101.save 734K
- tha_esa_peer_eflux_20080101.save 3.7M
- tha_fgm_fgs_gsm_20080101.save 623K
- tha_state_pos_gsm_20080101.save 28K
- tha_state_vel_gsm_20080101.save 28K
- tha_sst_psif_eflux_20080101.save 1002K
- tha_sst_psef_eflux_20080101.save 48K

Restoring a SAVE File

```
IDL> restore, 'tha_fgm_fgs_gsm_20070701.save'
```

```
IDL> help
```

BX_GSM	FLOAT	Array[28719]
BY_GSM	FLOAT	Array[28719]
BZ_GSM	FLOAT	Array[28719]
DAY	INT	1
HOUR	BYTE	Array[28719]
MINUTE	BYTE	Array[28719]
MONTH	INT	7
SECOND	FLOAT	Array[28719]
YEAR	INT	2007

IDL Procedures for Date and Time

Download from:

Johns Hopkins Applied Physics Laboratory IDL Web Page

http://fermi.jhuapl.edu/s1r/idl/s1rlib/local_idl.html

Required procedures:

[ymds2js.pro](#) - converts date and time to Julian second

[js2ymds.pro](#) - converts Julian second to date and time

[strsec.pro](#) - converts seconds to a time string

[ymd2jd.pro](#) - converts date to Julian day

[jd2ymd.pro](#) - converts Julian day to date

Converting Time to Julian Second

program1.pro:

```
sec=hour*3600.+minute*60.+second  
js=ymds2js(year,month,day,sec)  
end
```

```
IDL> .run program1
```

```
IDL> help, js
```

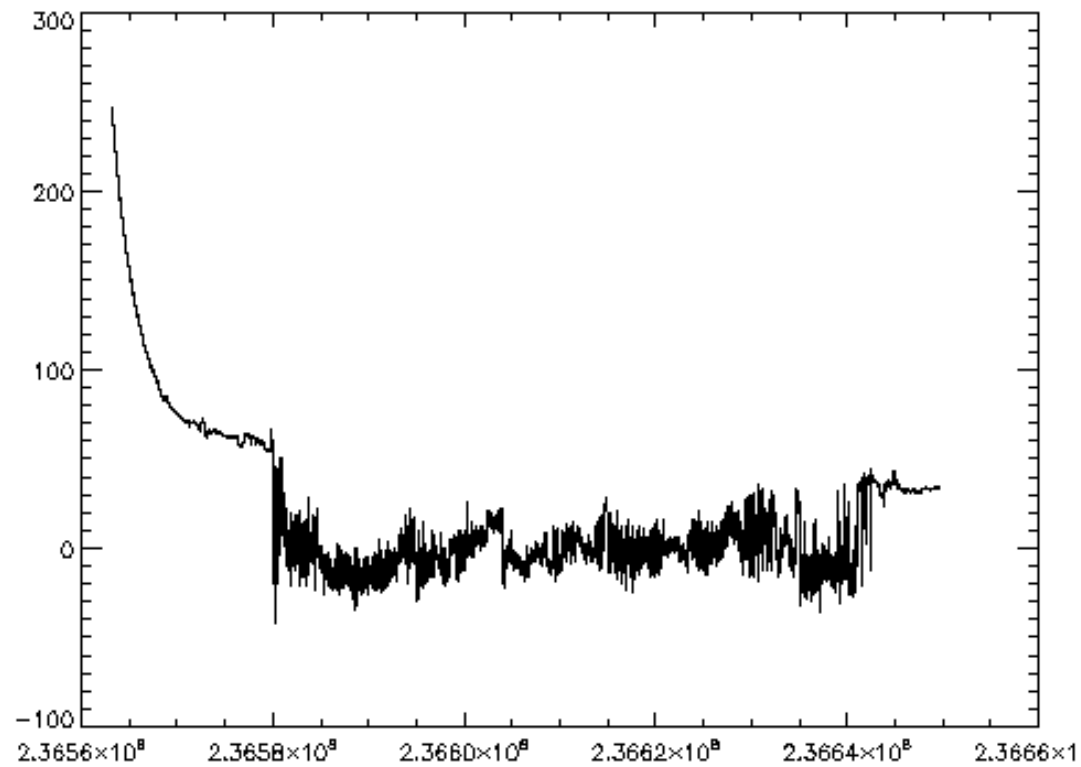
```
JS    DOUBLE    Array[28719]
```

For the ymds2js.pro procedure:

zero timing for Julian second is set at 00:00:00 UT, January 1, 2000.

Timing is negative before this date. Timing is positive after this date.

IDL> plot, js, bz_gsm



Plotting for a Specific Time Range: Calculate xmin and xmax

program2.pro:

```
start_hour = 00
start_minute = 00
start_second = 00
end_hour = 10
end_minute = 00
end_second = 00
start_sec=start_hour*3600.+start_minute*60.+start_second
xmin=ylds2js(year,month,day,start_sec)
end_sec=end_hour*3600.+end_minute*60.+end_second
xmax=ylds2js(year,month,day,end_sec)
end
```

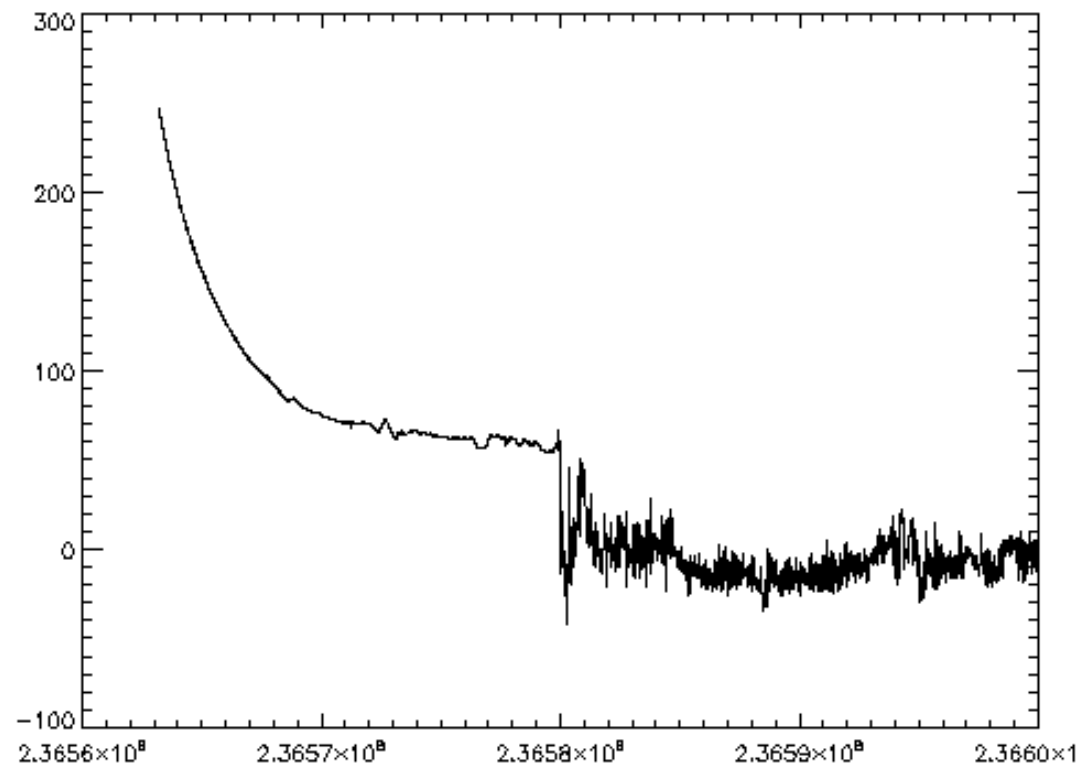
IDL> .run program2

IDL> help, xmin, xmax

XMIN DOUBLE = 2.3656320e+008

XMAX DOUBLE = 2.3659920e+008

IDL> plot, js, bz_gsm, xrange = [xmin, xmax]



Creating Ticknames for Time Axis: Determine timlbl and blanklbl

program3.pro:

```
xticks=5
delta=findgen(xticks+1)
delta=delta*(xmax-xmin)/xticks+xmin
timlbl=strarr(xticks+1)
blanklbl=replicate(' ',xticks+1)
for i=0,xticks do begin
    js2ymds,delta(i),y,m,d,s
    timlbl(i)=strmid(strsec(s),0,5)
Endfor
end
```

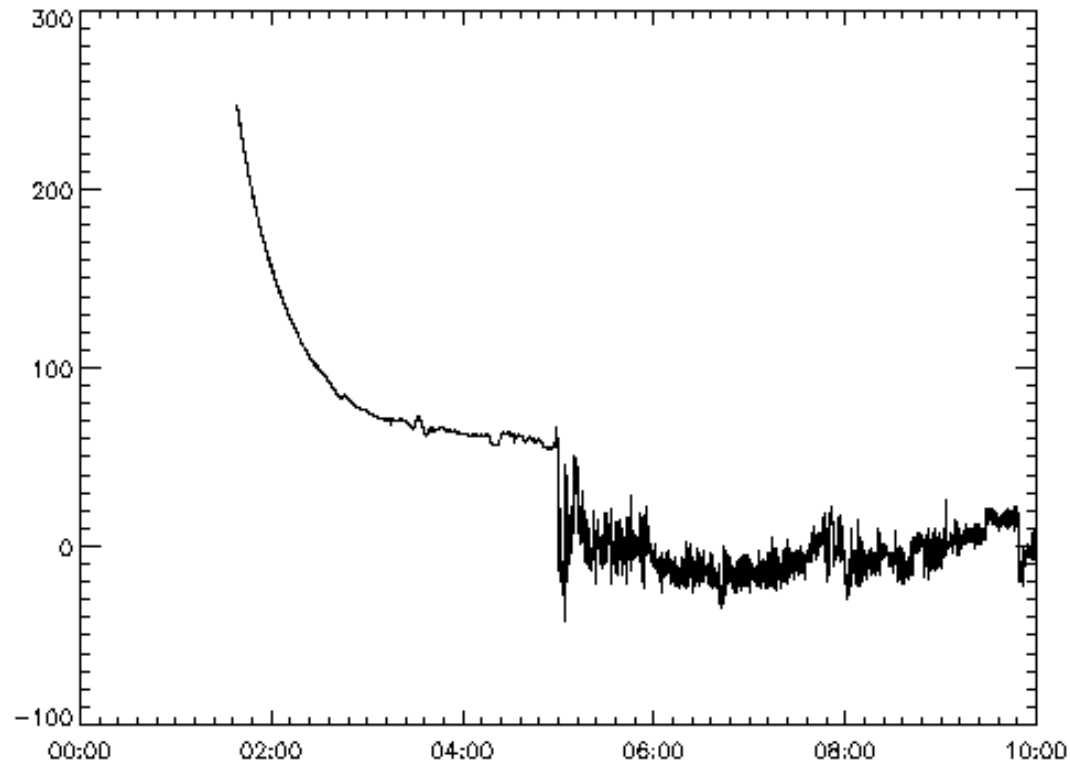
IDL> .run program3

IDL> help

TIMLBL STRING = Array[6]

BLANKLBL STRING = Array[6]


```
IDL> plot, js, bz_gsm, xrange = [xmin,  
xmax], xticks=xticks, xtickname = timlbl
```



Making a Plot with Multiple Panels

Use the POSITION keyword in the PLOT procedure:

```
position = [x0, y0, x1, y1]
```

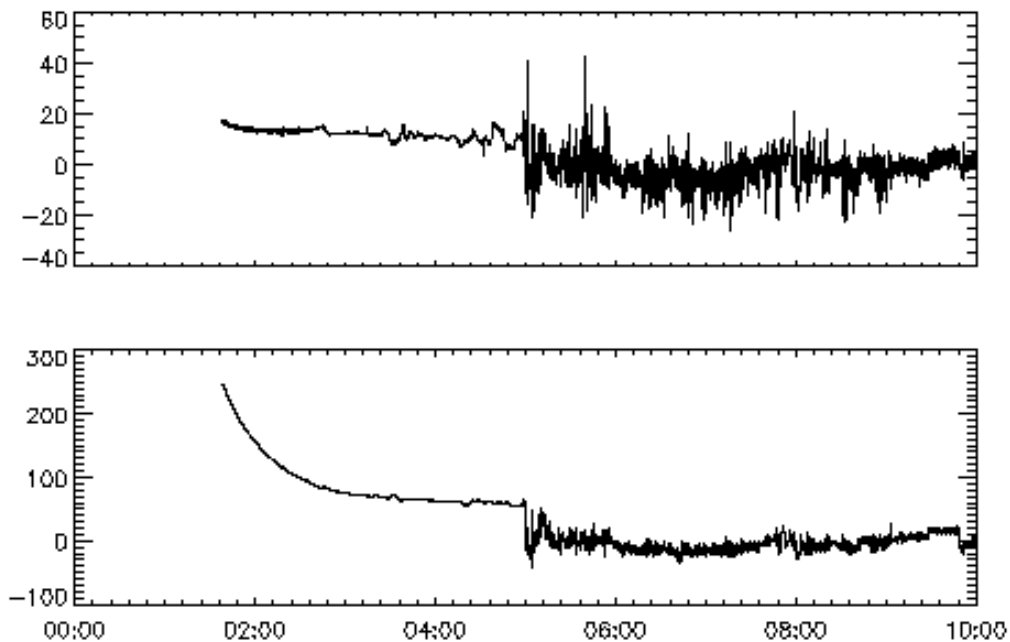
(x0, y0) is the coordinate of the **lower-left** corner of the data window.

(x1, y1) is the coordinate of the **upper-right** corner of the data window.

The coordinates are in **normalized** units ranging **from 0.0 to 1.0**.

```
IDL> plot, js, bx_gsm, xrange = [xmin, xmax], xticks = xticks,  
      xtickname = blanklbl, position = [0.1, 0.1, 0.9, 0.4]
```

```
IDL> plot, js, bz_gsm, xrange = [xmin, xmax], xticks = xticks,  
      xtickname = timlbl, position = [0.1, 0.5, 0.9, 0.8], /noerase
```



Summary

- IDL SAVE files can simplify your work on data reading. **Try it! You will see the difference!**
- IDL SAVE files for THEMIS data are available on the **Taiwan AIDA** web page:
http://themis.ss.ncu.edu.tw/e_data_download.php