

# FMG Data Analysis Tutorial

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# Image Browser



<http://aso-s.pmo.ac.cn/sodc/imageBrowser.jsp>

Time: 2023.04.02 04:54:22 UT

AR 13267

Quick Look Data Access Analysis Software Guide Operation Back Home

### Image Browser

The SDI data is between April 2, 2023 and April 3, 2023. The other data starts from April 1, 2023.

Image Type: FMG longitudinal magnetic field active regi

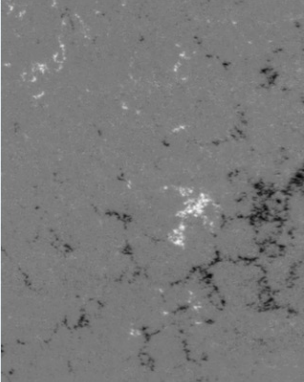
Display one image per x: 10 (numeric(eg, 1 per 10 images), 'hour' or 'day')

Start Date: 04/02/2023 00:00 End Date: 04/05/2023 16:04 Display: Slideshow

Search

If no data is shown. Please adjust the date range.

43/246



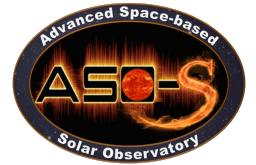
fmg\_lev20\_AR13267\_20230402\_045422.952\_bj\_0478X0600\_v01.png  
interval = 0.5s

Slower Play Stop Backward Faster

The screenshot shows the ASO-S Image Browser interface. At the top, there is a navigation bar with links for "Quick Look", "Data Access", "Analysis Software", "Guide", "Operation", and "Back Home". The main content area is titled "Image Browser" and provides information about the data range: "The SDI data is between April 2, 2023 and April 3, 2023. The other data starts from April 1, 2023." Below this, there are several controls: "Image Type" is set to "FMG longitudinal magnetic field active regi"; "Display one image per x" is set to "10"; "Start Date" is "04/02/2023 00:00" and "End Date" is "04/05/2023 16:04"; "Display" is set to "Slideshow". There is a "Search" button and a message "If no data is shown. Please adjust the date range." A large solar image is displayed in the center, with a progress indicator "43/246" above it. At the bottom, there is a file name "fmg\_lev20\_AR13267\_20230402\_045422.952\_bj\_0478X0600\_v01.png" and "interval = 0.5s", along with playback controls: "Slower", "Play", "Stop", "Backward", and "Faster".

# Data Archive

<http://aso-s.pmo.ac.cn/sodc/dataArchive.jsp>



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## Data Access

- ✓ Data Policy
- ✓ Data Archive
- ✓ Cutout Service

## Step 1: Register

Enter your email address after “Email” , click on “Search” , then click on the “User Registration” button.

The screenshot shows the ASO-S Data Archive web interface. The navigation bar includes 'Quick Look', 'Data Access' (highlighted with a red box), 'Analysis Software', 'Guide', 'Operation', and 'Back Home'. The main content area is titled 'Data Archive' and contains the following text: 'The ASO-S data policy can be found [here](#). The SDI data is between April 2, 2023 and April 3, 2023. The other data starts from April 1, 2023.' Below this, there are search filters for 'Start Time' (04/10/2023 00:00) and 'End Time' (04/11/2023 08:03). The interface lists data types: HXI, FMG, LST, and WST, each with various levels and modes. At the bottom, there is an 'Email' field containing 'su.yingna@163.com', a 'Search' button, a 'Tar and Download Data' button, and a 'Reset' button. A 'Result' section shows 'File Count', 'Probable Size(MB)', and 'Request ID'. A 'Data Export Status and Retrieval' section is also visible. A modal dialog box is overlaid on the page, displaying the message: 'Sorry, the email is not registered. Please register it first.' with a 'User Registration' button.

## Step 1: Register

### User Registration


#### User Registration

Email:

Name:

Institution/Organization:

Verify Code:

 Not Clear?

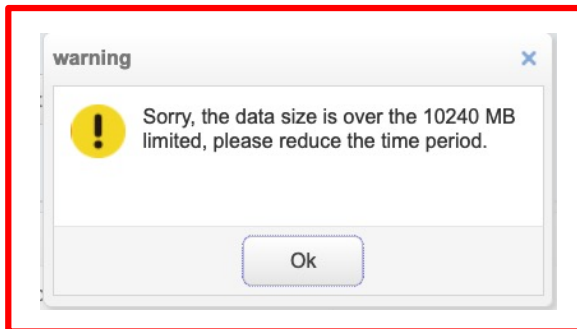
# Data Archive

## Step 2: Search and Download data

Two ways to download the data:

- Tar and Download Data
- download

Limitation



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### Data Archive

The ASO-S data policy can be found [here](#).

The SDI data is between April 2, 2023 and April 3, 2023. The other data starts from April 1, 2023.

Start Time: 04/02/2023 00:00   End Time: 04/02/2023 03:00

**HXI** ?  
Level Q1:  Hourly Fits    Hourly Png    Data-production status Png  
Level 1:  Detector Data

**FMG** ?  
Level:  2-AR  
Mode:  Routine    User-defined Cadence [ ] s

**LST** ?  
SDI Level:  1    Background  
SDI Mode:  Routine    Burst-1024    Burst-4608    User-defined Cadence [ ] s

**WST** ?  
WST Level:  1  
WST Mode:  Routine    Burst-1024    Burst-4608    User-defined Cadence [ ] s

Email: ynsu@pmo.ac.cn   Search   **Tar and Download Data**   Reset

**Result**   File Count : 351   Probable Size(MB) : 2255   Request ID :

#### Data Export Status and Retrieval

Request ID : [ ]    Check Status   Status :

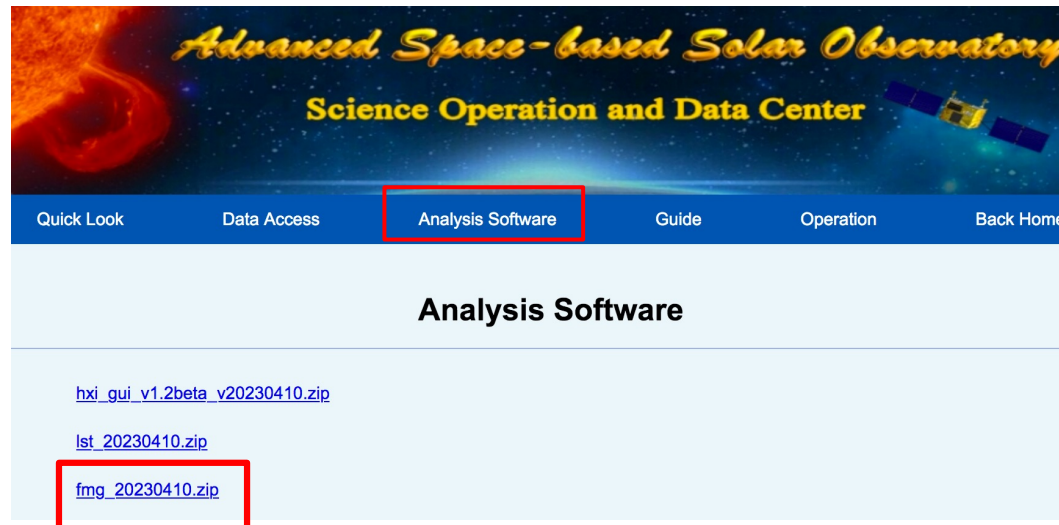
Link : [ ] Download Link

	File Name	Download
1	hxi_det_lev10_20230402_000002.135_v03.fits	<a href="#">download</a>
2	hxi_det_lev10_20230402_010002.121_v03.fits	<a href="#">download</a>
3	hxi_det_lev10_20230402_020002.108_v02.fits	<a href="#">download</a>
4	fmg_lev20_AR13264_20230402_004101.661_scienc_rout_bl_v01.fits.gz	<a href="#">download</a>
5	fmg_lev20_AR13265_20230402_004101.661_scienc_rout_bl_v01.fits.gz	<a href="#">download</a>
6	fmg_lev20_AR13266_20230402_004101.661_scienc_rout_bl_v01.fits.gz	<a href="#">download</a>

# Software Installation



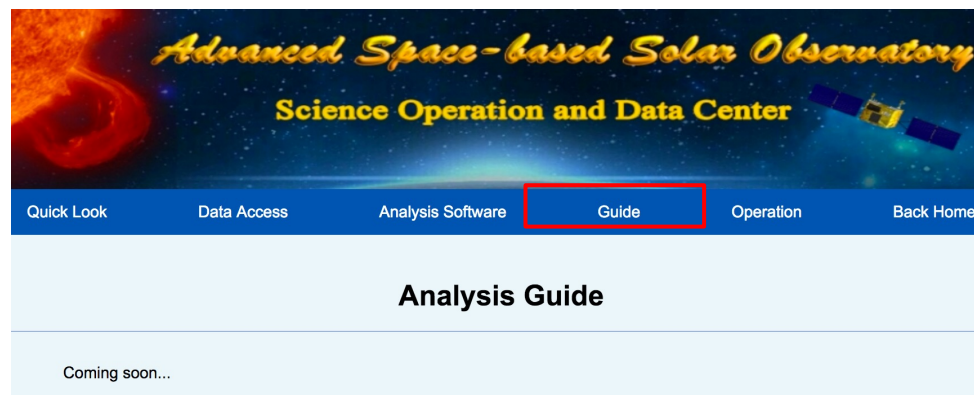
## 1. Access from Website



## 2. Access from SSW

Analysis guide

Coming soon



# Analysis Software



## FMG

<http://aso-s.pmo.ac.cn/sodc/analysisSoftware.jsp>

名称	修改日期	大小	种类
change_headerfits_ar.pro	2022年8月18日 17:13	2 KB	IDL Pro...dure File
change_headerfits_full.pro	2022年8月18日 17:14	2 KB	IDL Pro...dure File
read_fm.pro	2023年2月20日 15:04	7 KB	IDL Pro...dure File

名称	修改日期	大小	种类
fmg_arpil.pro	昨天 17:39	3 KB	IDL Pro...dure File
pil_detect.pro	2022年8月18日 17:19	1 KB	IDL Pro...dure File

## Level 2.0 active region data

colorbar.pro

data

pil

read\_fm

fmg\_lev20\_AR13262\_20230...51\_scien\_rout\_bl\_v01.fits.gz

fmg\_lev20\_AR13267\_20230...52\_scien\_rout\_bl\_v01.fits.gz

## read\_fmng



The routine `read_fmng.pro` can be used to read both the header information and the data into IDL variables:

```
IDL>read_fmng, filename, index, data
```

The input argument `filename` contains **one filename** to be read into IDL. Note that “`read_fmng.pro`” can also read compressed fits files, such as

“`fmg_lev20_AR13267_20230402_045422.952_scienc_rout_bl_v01.fits.gz`” . On output, the index (header) information and image data will appear in the variables `index` and `data`, respectively.



## read\_fmng



For example, the FMG data is located at the directory “data/” .

Example: For level 2 AR data, which include the longitudinal magnetic field and filter images of active regions as well as their respective header files.

```
IDL>filename='data/fmg_lev20_AR13267_20230402_045422.952_scienc_rout_bl_v01.fits.gz'
```

```
IDL>.r read_fmng/read_fmng.pro
```

```
IDL>read_fmng,filename,index,data
```

```
IDL>help,index
```

```
IDL>help,index.hdrwl
```

```
IDL>help,index.hdrbl
```

```
IDL>help,data
```

## read\_fmng



In order to display the **filter image**, one can:

```
IDL> window,0,xsize=index.hdrwl.naxis1,ysize=index.hdrwl.naxis1
```

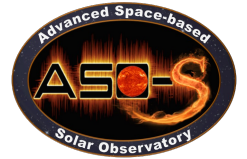
```
IDL> tv,bytsc1(data[*,*],max=7000,min=3000)
```

The **longitudinal magnetic field image** can be displayed via the following command:

```
IDL>window,0,xsize=index.hdrwl.naxis1,ysize=index.hdrwl.naxis1
```

```
IDL>tv,bytsc1(data[*,*],max=500,min=-500)
```

## pil detection



The SSWIDL routine `fmg_arpil.pro` can be used to give the length of the magnetic polarity inversion line (unit: Mm), and return the position of the maximum value of the magnetic field gradient in the data field of view (Unit: pixels), as well as the longitude and latitude of the position of the maximum value (Unit: degrees) for an input level 2.0 fits data file.

```
IDL>filein='data/fmg_lev20_AR13267_20230402_045422.952_scienc_rout_bl_v01.fits.gz'
```

```
IDL>.r pil/fmg_arpil.pro
```

```
IDL>fmg_arpil, filein, length, xmax, ymax, lonc_lmax, latc_lmax
```

```
IDL>help,length, xmax, ymax, lonc_lmax, latc_lmax
```

Read and display the **filter image**:

```
IDL>I=readfits('data/fmg_lev20_AR13267_20230402_045422.952_scienc_rout_bl_v01.fits.gz',hdrwl,ext=1)
```

```
IDL>tv,bytsc1(I,max=7000,min=3000)
```

Read and display the **longitudinal magnetic field image**:

```
IDL>BL=readfits('data/fmg_lev20_AR13267_20230402_045422.952_scienc_rout_bl_v01.fits.gz',hdrbl,ext=2)
```

```
IDL>tv,bytsc1(BL,max=500,min=-500)
```

## Others



One can also use other software to read and display the FMG data:

- ✓ Python
- ✓ Matlab
- ✓ SAOImage ds9

- <https://sites.google.com/cfa.harvard.edu/saoimageds9>
- <https://heasarc.gsfc.nasa.gov/docs/software/ftools/fv/>
- <https://www.gimp.org>
- <https://www.wolfram.com/mathematica/>
- <http://www.msbsoftware.it/avis/>
- <https://waps.cfa.harvard.edu/eduportal/js9/software.php>

For details, please refer to Dr. Suo Liu' s presentation on April 11, 2023.

## // The 4th ASO-S Meeting //

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### The 4th ASO-S Meeting

**Date:** China-America Session (April 10-11, 2023, America, EST; April 11-12, 2023, China, CST) and China-Europe Session (April 11-12, 2023, CST/UTC)

#### Introduction

The 4th ASO-S Meeting will be held online. It aims to facilitate use and analysis of ASO-S data by the broader community through introduction on ASO-S related topics and tutorials on data access analysis. There will be lectures and hands-on sessions. More information on attending the meeting will be obtained after the registration.

#### Registration

Open Mar 15, 2023

Close April 5, 2023

#### Program

#### Schedule

#### Training Resources

The videos and presentations during the meeting are now available [here](#) after the meeting.

// Science Team //

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Thank you for your attention!

