FMG Data Analysis Tutorial

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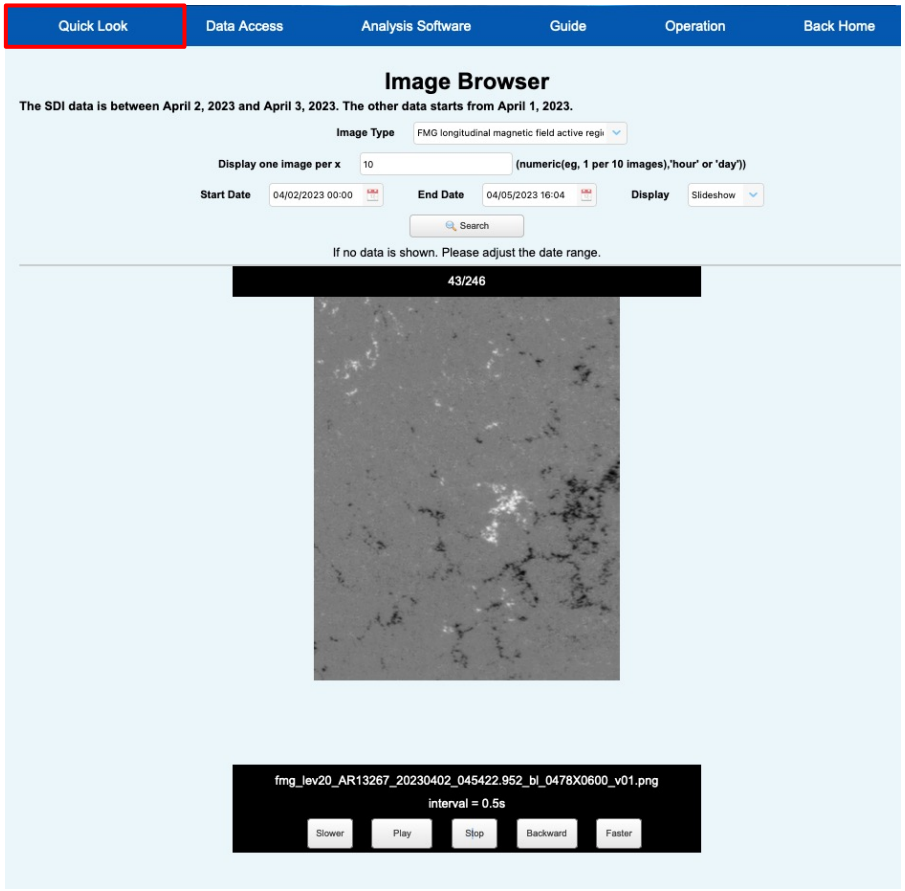
The 4th ASO-S Workshop on 2023 Apr 12

Image Browser

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

Time: 2023.04.02 04:54:22 UT

AR 13267



Data Archive

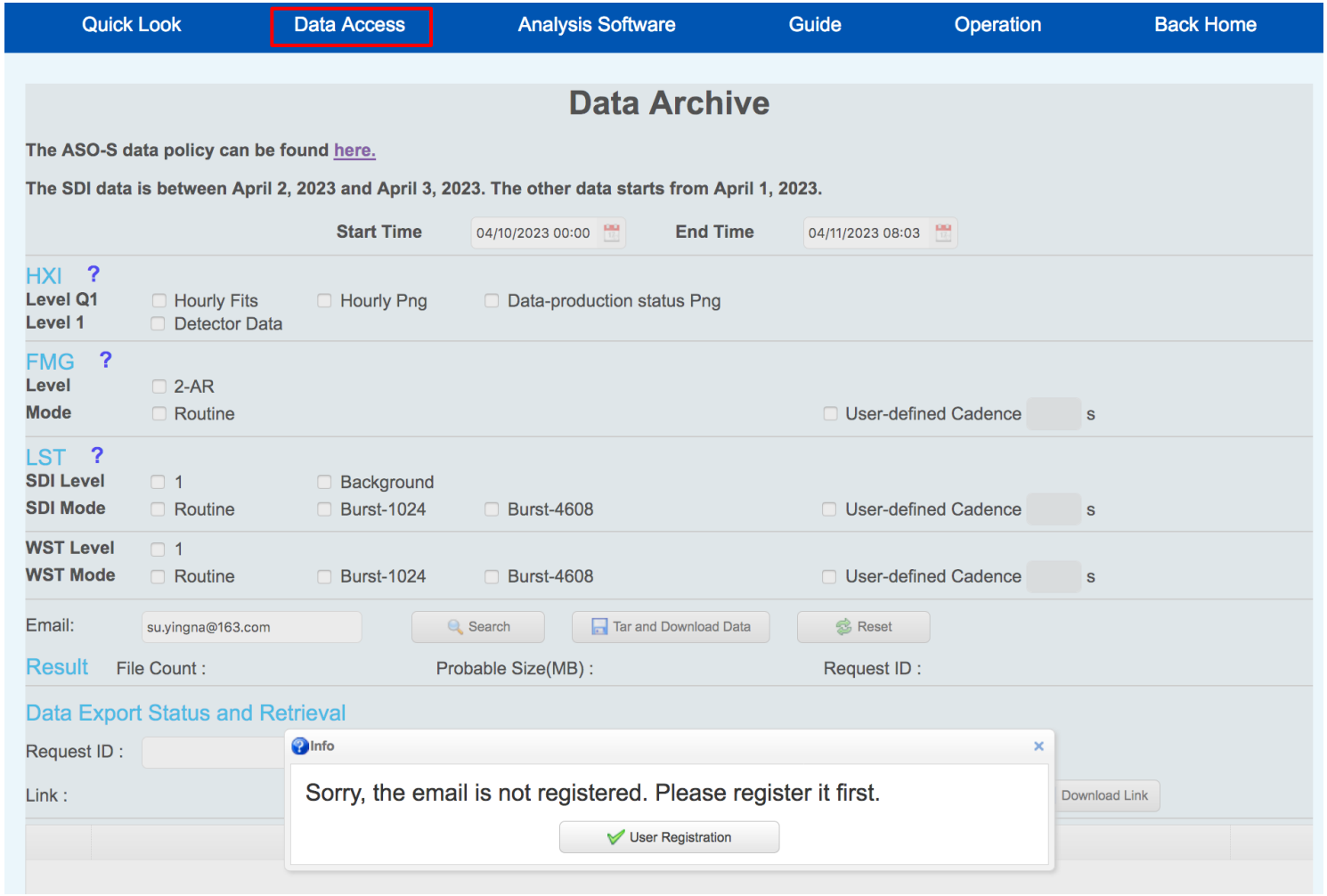
http://aso-s.pmo.ac.cn/sodc/dataArchive.jsp

Data Access

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

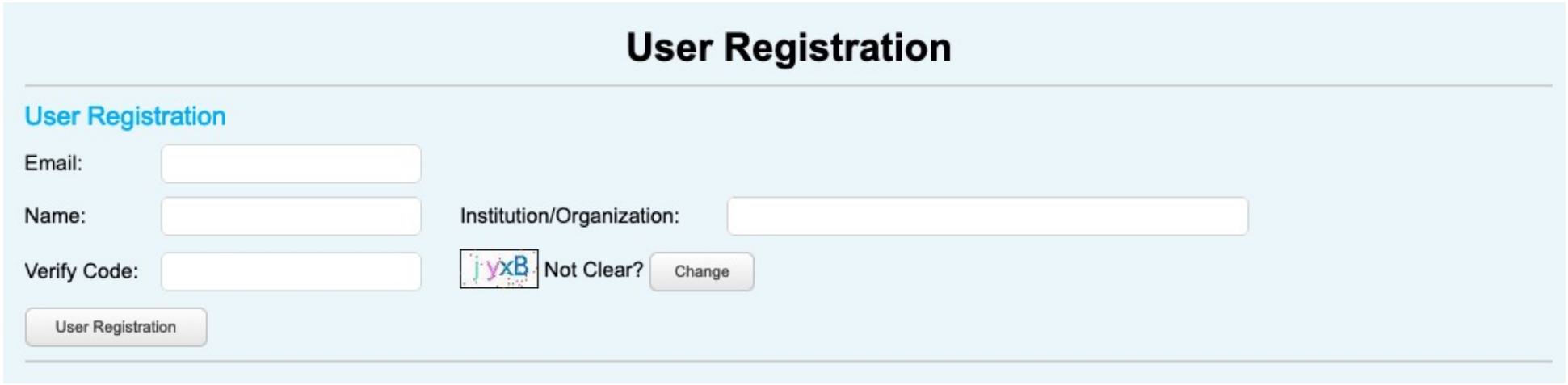
Step 1: Register

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



Data Archive

Step 1: Register



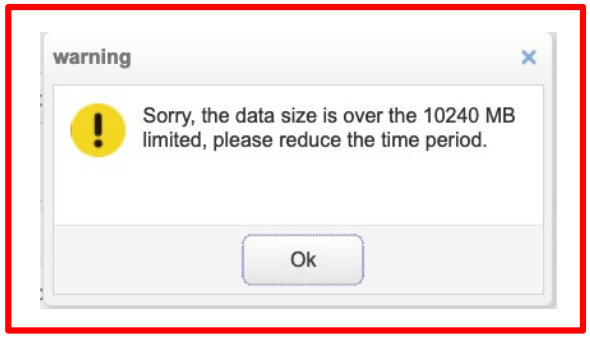
Data Archive

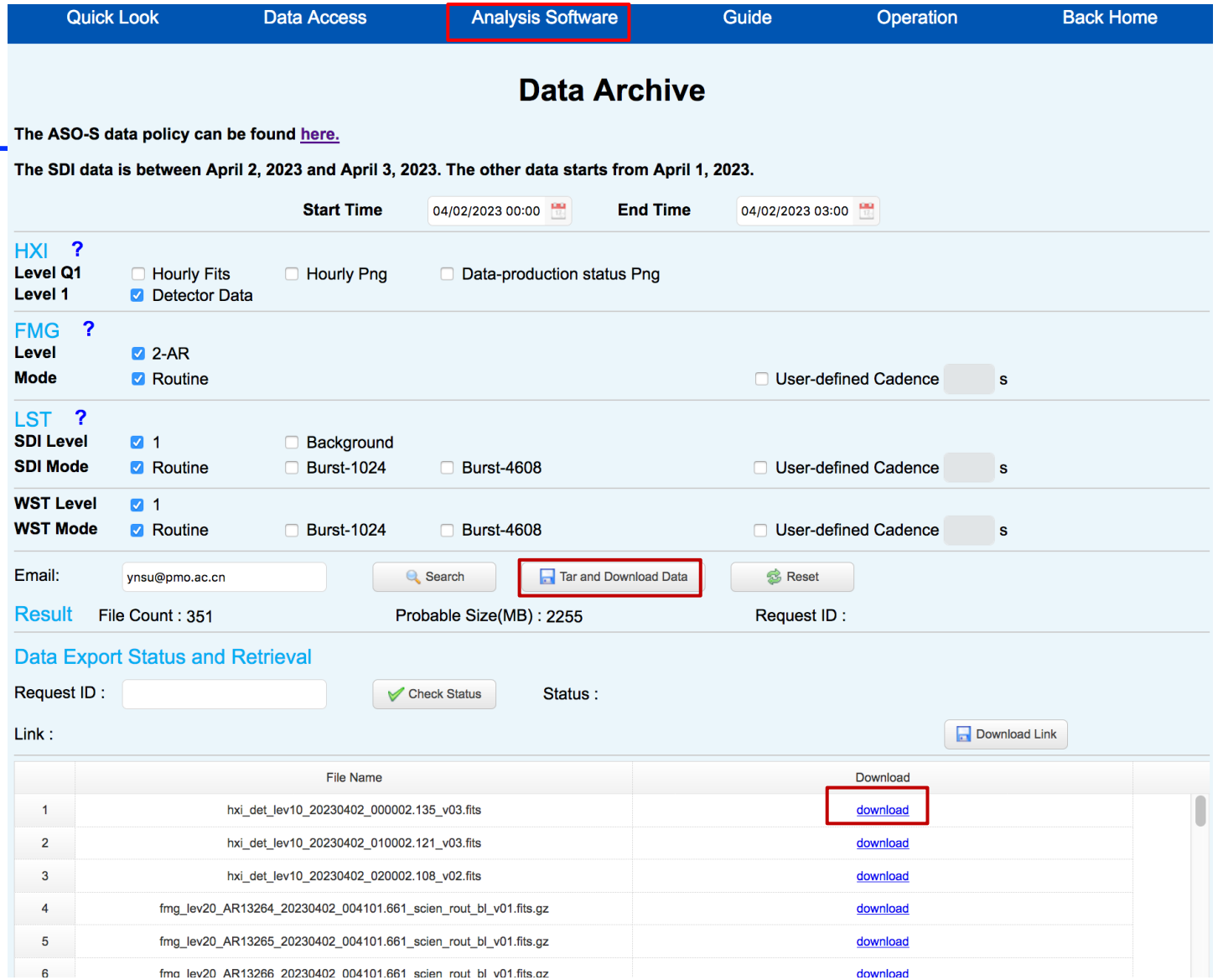
Step 2: Search and Download data

Two ways to download the data:

- Tar and Download Data
- download

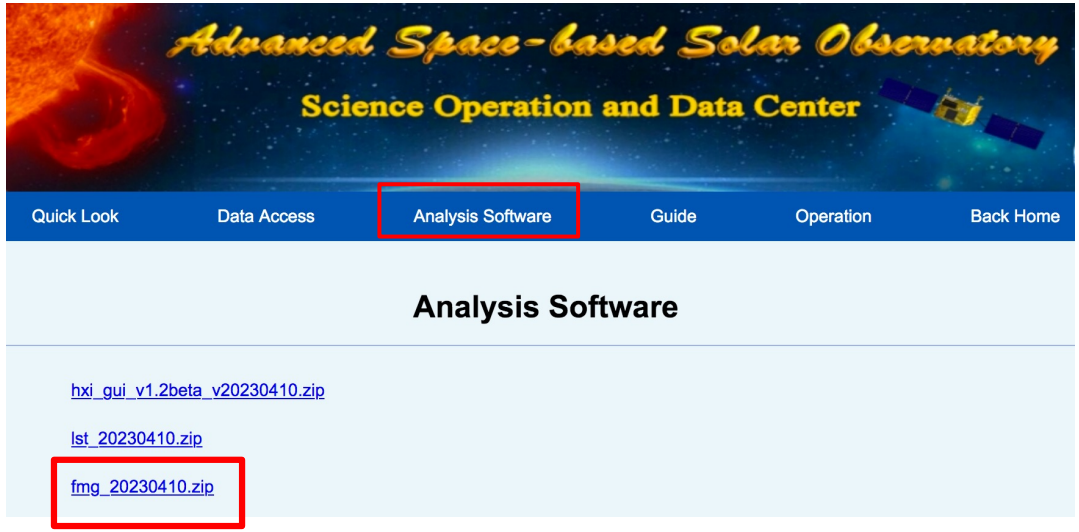
Limitation





Software Installation

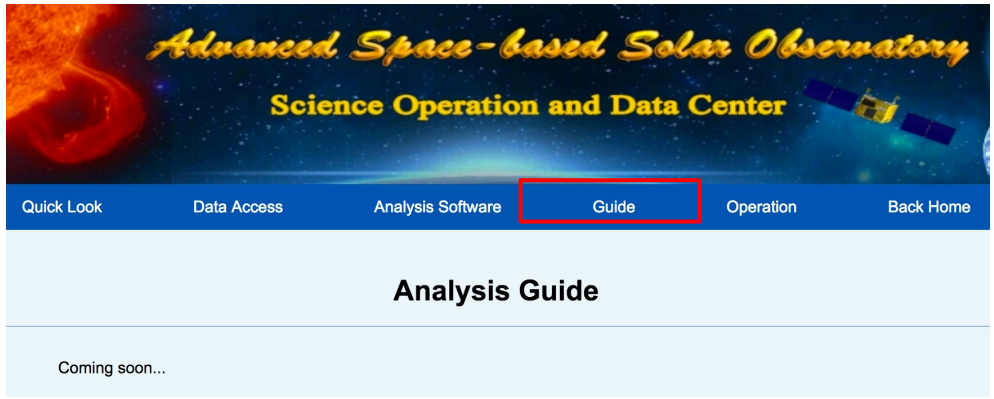
1. Access from Website



2. Access from SSW

Analysis guide

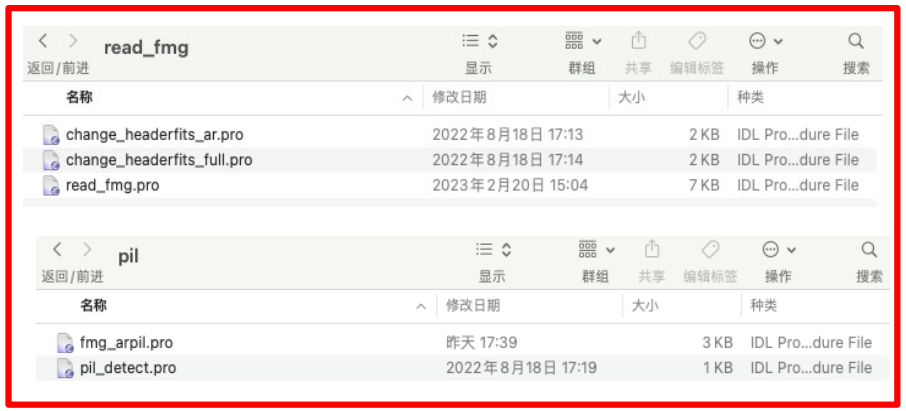
Coming soon



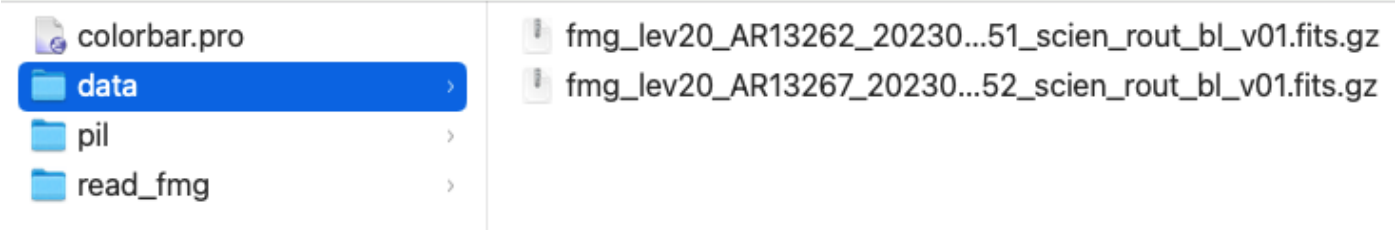
Analysis Software

FMG

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



Level 2.0 active region data



read_fmg

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

IDL>read_fmg, filename, index, data

The input argument filename contains one filename to be read into IDL. Note that “read_fmg.pro” can also read compressed fits files, such as “fmg_lev20_AR13267_20230402_045422.952_scien_rout_bl_v01.fits.gz”. On output, the index (header) information and image data will appear in the variables index and data, respectively.

read_fmg

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_scien_rout_bl_v01.fits.gz'

IDL>.r read_fmg/read_fmg.pro

IDL>read_fmg,filename,index,data

IDL>help,index

IDL>help,index.hdrwl

IDL>help,index.hdrbl

IDL>help,data
```

read_fmg

In order to display the filter image, one can:

```
IDL> window,0,xsize=index.hdrwl.naxis1,ysize=index.hdrwl.naxis1
IDL> tv,bytscl(data[*,*,0],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,bytscl(data[*,*,1],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_scien_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
```

readfits.pro

Read and display the filter image:

```
IDL>I=readfits('data/fmg_lev20_AR13267_20230402_045422.952_scien_rout_bl_v01.fits.gz',hdrwl,ext=1)

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

Read and display the longitudinal magnetic field image:

```
IDL>BL=readfits('data/fmg_lev20_AR13267_20230402_045422.952_scien_rout_bl_v01.fits.gz',hdrbl,ext=2)

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

Others

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

- ✓ Pythyon
- ✓ 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 //

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.

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Thank you for your attention!