

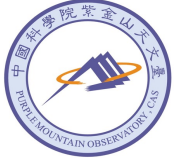


Introduction on Website and Software Installation

Yingna Su

Purple Mountain Observatory, CAS

The 4th ASO-S Workshop on 2023 Apr 11



Outline



- **Introduction on Website**
- Browse and Access Data
- Software Installation

ASO-S Homepage

English

http://aso-s.pmo.ac.cn/en_index.jsp

Chinese

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

Contact e-mail: aso-s@pmo.ac.cn

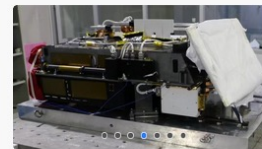


Advanced Space-based Solar Observatory (ASO-S)



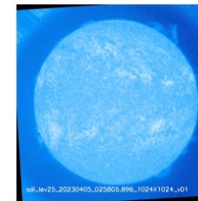
The Advanced Space-based Solar Observatory (ASO-S) was launched with the CZ-2D rocket at 07:43:55 Beijing time on October 9, 2022, opening the era of comprehensive solar space observation in China. The ASO-S mission was proposed by Chinese solar community in 2011. With the support of the "Strategic Priority Research Program of Space Science" of Chinese Academy of Sciences (CAS), ASO-S underwent Phase-0/A, Phase-A/B and comprehensive demonstration. At the end of 2017, it was formally approved by CAS. The scientific objectives can be summarized as '1M2B'. Here, '1M' stands for magnetic field while '2B' for the two major eruptive phenomena (bursts) on the Sun: solar flares and coronal mass ejections (CMEs). The mission aims at exploring connections among solar magnetic field, solar flares, and CMEs.

News

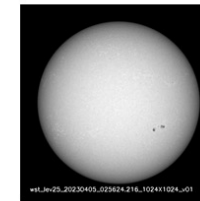


- | | |
|---|------------|
| Top 10 Chinese scientific advances for 2022 unveiled | 2023-01-12 |
| China unveils first batch of images taken by solar probe ASO-S | 2022-12-13 |
| China's space-based observatory sends first solar image | 2022-11-24 |
| BCAS: Looking into the Sun— Kuafu's first stride in space | 2022-10-17 |
| Sky&Telescope: China has sent up the ASO-S space observatory L... | 2022-10-11 |
| Chinadaily: Space telescope to keep an eye on sun | 2022-10-09 |

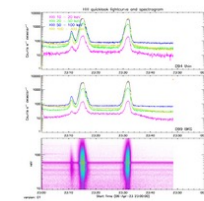
The Sun Today



SDI



WST



HXI

Links

- CAS
- Hinode
- IRIS
- RHESSEI
- SDO
- SOHO

Links

- PMO
- Solar Orbiter
- STEREO
- CHASE
- NVST
- PSP

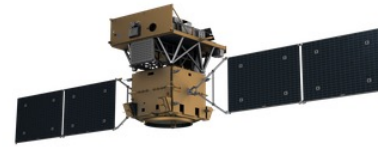
Website Visits: 6042
Email: aso-s@pmo.ac.cn

Satellite



- Mission Name
- Mission Overview**
- Instruments
- Scientific Objectives
- Team
- Committee
- ASO-S launch

// Advanced Space-based Solar Observatory (ASO-S) //



The ASO-S mission aims at exploring connections among solar magnetic field, solar flares, and CMEs. ASO-S mission has three payloads onboard: the Full-disk solar vector MagnetoGraph (FMG), the Lyman-alpha Solar Telescope (LST), and the solar Hard X-ray Imager (HXI). They are proposed to measure solar magnetic field, to observe CMEs and solar flares. The unique combination of these payloads allows simultaneous observations of vector magnetic field of the full Sun, imaging spectroscopy at high energies of solar flares, formation and evolution of solar flares and CMEs on the disk and in the inner corona. It will not only advance our understanding of the underlying physics of solar eruptions, but also help to improve forecast capability of space weather.

ASO-S is formally approved by the Chinese Academy of Sciences (CAS) under the Strategic Priority Research Program on Space Science in June 2017. At 07:43:55 Beijing time on October 9, 2022, the satellite is launched with the CZ-2D rocket. The nominal mission life is 4 years.

According to the scientific objectives and tasks of the mission, in order to obtain as much observation time as possible, the ASO-S satellite adopts a sun synchronous orbit (SSO) with an altitude of about 720 km and an orbital period of about 99 minutes. It has an inclination angle of around 98.2 degree. The satellite will go through the shadow of the Earth between middle May and August with a maximum eclipse time of 18 minutes. The spacecraft points to the Sun with the three axes stabilized.



- Science Team
- Publications
- Meeting

// Science Team //

Weiqun Gan	Chief Scientist of ASO-S Mission, wqgan@pmo.ac.cn
Hui Li	Chief Engineer of the Science Operations and Data Center of the ASO-S Mission (ASODC), nj.lhui@pmo.ac.cn
Yu Huang	Chief Engineer of ASODC and Chief Designer of Satellite Science Operations, huangyu@pmo.ac.cn
Youping Li	Chief Designer of Satellite Data Processing, yplee@pmo.ac.cn
Shijun Lei	Chief Designer of Satellite Data Management, sjlei@pmo.ac.cn
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Jiangtao Su	FMG Payload Data Scientist, sjt@nao.cas.cn
Suo Liu	Core Member of the FMG Science Team
Xianyong Bai	Core Member of the FMG Science Team
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Youping Li	Core Member of the HXI Science Team
Wei Chen	Core Member of the HXI Science Team
Yu Huang	Core Member of the HXI Science Team
Dong Li	Core Member of the HXI Science Team
Li Feng	LST Payload Data Scientist, lfeng@pmo.ac.cn
Hui Li	LST Payload Scientist
Ying Li	Core Member of the LST Science Team
Jie Zhao	Core Member of the LST Science Team
Lei Lu	Core Member of the LST Science Team
Yu Huang	Core Member of the LST Science Team
Qingmin Zhang	Core Member of the LST Science Team

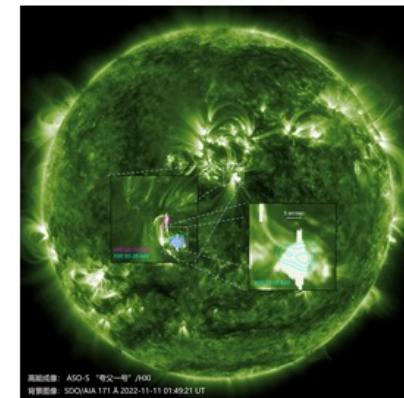
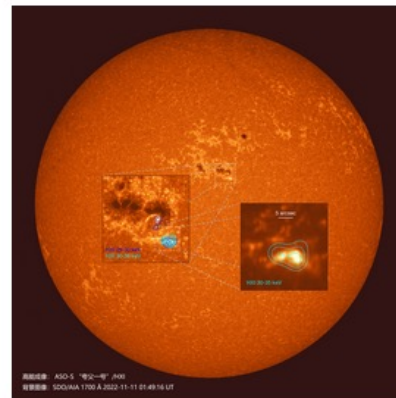
Gallery



Image Gallery

Video Gallery

// Image Gallery //



Resource



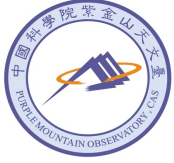
The Sun

Media

Video

- ▶ Sunspots
- ▶ The Sun's Magnetic Fields
- ▶ Solar magnetic field and Solar activities
- ▶ Periodic Variation of Solar Magnetic Fields
- ▶ Solar prominence and filament
- ▶ Solar Flares
- ▶ Coronal Mass Ejections

Email: aso-s@pmo.ac.cn



Outline



- Introduction on Website
- **Browse and Access Data**
- Software Installation

Data Software



- Data Policy
- ASO-S Today
- Image Browser
- Data Archive
- Cutout Service
- Analysis Software
- Analysis Guide

// Data Policy of ASO-S Mission //

1. The scientific data of ASO-S mission are completely open to the community except the data obtained during the mission commissioning phase and some of the engineering data. All users have the same right to use the scientific data of ASO-S mission as the team members .

2. In order to have the best knowledge of the instrumentation and meaning of the data, users when writing papers are encouraged to collaborate with team members (one is enough), who might be the payload scientist, payload data scientist, or any of team members listed on the homepage of ASO-S mission, especially for the first two years of the mission.

3. All the scientific data, calibration and processing software, usage documentation, and update information are provided via the ASO-S homepage at http://aso-s.pmo.ac.cn/en_index.jsp. Browse and quick-look products are not intended for science analysis and publications.

4. Users are suggested to acknowledge the sources of data used in all publications as **"ASO-S mission is supported by the Strategic Priority Research Program on Space Science, the Chinese Academy of Sciences, Grant No. XDA15320000"**. The use of ASO-S images, animations and videos for non-commercial purposes and public outreach efforts is strongly encouraged. It is requested, however, that any such use should mention explicitly the source from the ASO-S mission.

5. Any software contributions to the data processing and analyzing by the users are welcome. The payload data scientists are the corresponding persons to contact.

ASO-S Today

Quick Look

- ✓ ASO-S Today
- ✓ Image Browser

The screenshot displays the ASO-S Science Operation and Data Center website. The header features the text "Advanced Space-based Solar Observatory" and "Science Operation and Data Center" against a background of a solar flare and a satellite. A navigation bar includes "Quick Look" (highlighted with a red box), "Data Access", "Analysis Software", "Guide", "Operation", and "Back Home".

The main content area is titled "ASO-S Today (Daily images/movies)" and includes the text: "The SDI data is between April 2, 2023 and April 3, 2023. The other data starts from April 1, 2023." Below this is a "Date:" field with "04/02/2023" entered and an "OK" button.

The "LST" section contains two columns: "SDI" and "WST".

- SDI:** Shows a blue-tinted image of the Sun's surface with solar activity. Below the image is the file name "sdi_rev15_20230402_025907.993_1024x1024_v01" and a "Download" button.
- WST:** Shows a white-tinted image of the Sun's surface. Below the image is the file name "wst_lev25_20230402_220422.996_1024x1024_v01" and a "Download" button.

The "HXI" section displays three panels of data:

- The top panel is titled "HXI quicklook lightcurve and spectrogram" and shows multiple lightcurve traces for different energy channels (e.g., 005-10, 10-20 keV) over time.
- The middle panel shows another set of lightcurve traces for different energy channels.
- The bottom panel is a spectrogram showing intensity as a function of energy and time.

Image Browser



Image Types

A screenshot of the ASO-S Image Browser web application. The header features the text 'Advanced Space-based Solar Observatory Science Operation and Data Center' in a golden, cursive font against a background of a solar flare and a satellite. Below the header is a blue navigation bar with buttons for 'Quick Look', 'Data Access', 'Analysis Software', 'Guide', 'Operation', and 'Back Home'. The main content area is titled 'Image Browser' and includes a text notice: 'The SDI data is between April 2, 2023 and April 3, 2023. The other data starts from April 1, 2023.' The interface contains several interactive elements: an 'Image Type' dropdown menu with a list of options including 'SDI image', 'WST image', 'HXI light curve', 'HXI data production status', 'HXI HKD quicklook', 'FMG longitudinal magnetic field active region', and 'FMG filter image active region'; a 'Display one image per x' input field set to '10'; a 'Start Date' input field with the value '04/03/2023 00:00' and a calendar icon; and a 'Display' dropdown menu set to 'List'. A red box highlights the 'Quick Look' button in the navigation bar.

Image Browser



Advanced Space-based Solar Observatory
Science Operation and Data Center

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: SDI image

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

Start Date: 04/02/2023 00:00 End Date: 04/03/2023 15:59 Display: List

Search

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

	File Name	Picture Preview
1	sdi_lev15_20230402_024907.983_1024X1024_v01.jpg	
2	sdi_lev15_20230402_025907.983_1024X1024_v01.jpg	
3	sdi_lev15_20230402_030907.983_1024X1024_v01.jpg	
4	sdi_lev15_20230402_031907.983_1024X1024_v01.jpg	
5	sdi_lev15_20230402_032907.983_1024X1024_v01.jpg	
6	sdi_lev15_20230402_033907.983_1024X1024_v01.jpg	
7	sdi_lev15_20230402_034907.983_1024X1024_v01.jpg	
8	sdi_lev15_20230402_035907.983_1024X1024_v01.jpg	
9	sdi_lev15_20230402_040907.983_1024X1024_v01.jpg	

Advanced Space-based Solar Observatory
Science Operation and Data Center

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: SDI image

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

Start Date: 04/02/2023 00:00 End Date: 04/03/2023 15:59 Display: Slideshow

Search

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

1/221

sdi_lev15_20230402_024907.983_1024X1024_v01

sdi_lev15_20230402_024907.983_1024X1024_v01.jpg

Slower Play Stop Backward Faster

Image Browser



Image Browser

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

Image Type:

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

Start Date: End Date: Display:

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

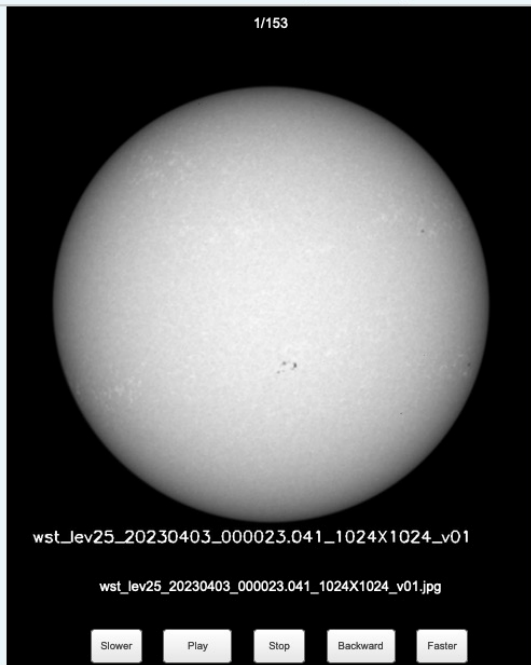


Image Browser

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

Image Type:

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

Start Date: End Date: Display:

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

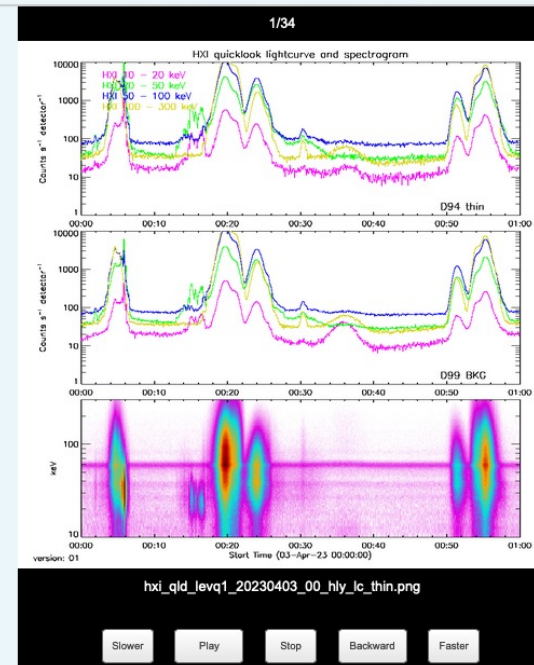


Image Browser



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: HXI HKD quicklook

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

Start Date: 04/03/2023 00:00 End Date: 04/10/2023 16:04 Display: Slideshow

Search

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

1/17

HXI quicklook for HK Data, produced @ 2023-04-06T23:20:30

The figure consists of four vertically stacked line plots sharing a common x-axis representing 'Start time (03-Apr-23 00:00:00)' from 00:00 to 01:00. The top plot shows 'Total flux (counts)' in red and 'BKG flux (counts)' in blue, with a y-axis from 100 to 10000. The second plot shows 'High Voltage (FEEO, in V)' in purple, with a y-axis from 200 to 900. The third plot shows 'T (degree C)' for 'Front: 1 2 3' and 'Rear: 4 5 6' in various colors, with a y-axis from 22.0 to 23.0. The bottom plot shows 'POS angle (degree)' for 'X Y Z' in various colors, with a y-axis from -0.004 to 0.002.

hxi_qld_levq1_20230403_00_hly_hkd.png

interval = 0.5s

Slower Play Stop Backward Faster

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

Data Archive



Quick Look

Data Access

Analysis Software

Guide

Operation

Back Home

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

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: 04/10/2023 00:00 End Time: 04/11/2023 08:03

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 Level 1
WST Mode Routine Burst-1024 Burst-4608 User-defined Cadence s

Email:

Result File Count : Probable Size(MB) : Request ID :

[Data Export Status and Retrieval](#)

Request ID : Link :

Info

Sorry, the email is not registered. Please register it first.

Step 1: Register

User Registration

User Registration

Email:

Name:

Institution/Organization:

Verify Code:



Not Clear?

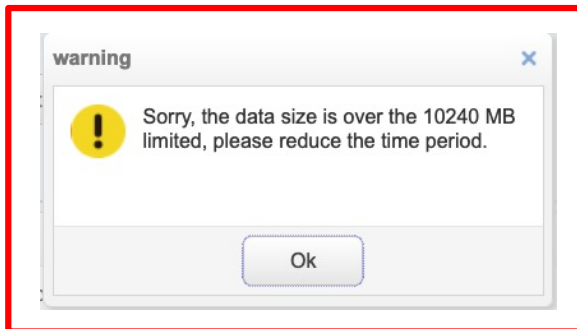
Data Archive

Step 2: Search and Download data

Two ways to download the data:

- Tar and Download Data
- download

Limitation



Quick Look Data Access **Analysis Software** Guide Operation Back Home

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 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	download
2	hxi_det_lev10_20230402_010002.121_v03.fits	download
3	hxi_det_lev10_20230402_020002.108_v02.fits	download
4	fmg_lev20_AR13264_20230402_004101.661_scienc_rout_bl_v01.fits.gz	download
5	fmg_lev20_AR13265_20230402_004101.661_scienc_rout_bl_v01.fits.gz	download
6	fmg_lev20_AR13266_20230402_004101.661_scienc_rout_bl_v01.fits.gz	download

Cutout Service



Data Access

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

Limitation

warning

! Sorry. The date range is over two days. please reduce the time range.

Ok

Quick Look **Data Access** Analysis Software Guide Operation Back Home

Cutout Service

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

LST ?

SDI Level 1

Cadence(optional) User-defined Cadence s

WST Level 1

Cadence(optional) User-defined Cadence s

Cutout Xcenter (arcsec) Ycenter (arcsec) Xrange (arcsec) Yrange (arcsec)

Tracking (optional) Reference Time: 04/02/2023 00:00

Requirement The arcsec range for x-axis is between [-1150,1150]. Xrange>0, Xcenter-(Xrange/2)>=-1150, Xcenter+(Xrange/2)<=1150.
The arcsec range for y-axis is between [-1150,1150]. Yrange>0, Ycenter-(Yrange/2)>=-1150, Ycenter+(Yrange/2)<=1150.

Email:

Result File Count : 66 Probable Size(MB) : 1708 Request ID :

Data Export Status and Retrieval

Request ID : Status :

Link :



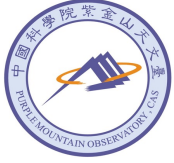
Advanced Space-based Solar Observatory

Science Operation and Data Center

[Quick Look](#)[Data Access](#)[Analysis Software](#)[Guide](#)[Operation](#)[Back Home](#)

Observation Application

This page will be online once we are ready to support the observation application.



Outline



- Introduction on Website
- Browse and Access Data
- **Software Installation**

Analysis Software



FMG

read_fm				
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	

pil				
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	

LST

LST				
名称	修改日期	大小	种类	
disk_despik.pro	今天 08:19	4 KB	IDL Pro...dure File	
ind_la_cosmic.pro	今天 08:19	33 KB	IDL Pro...dure File	
lst_fitshdr2struct.pro	今天 08:19	8 KB	IDL Pro...dure File	
lst_gen_hdr_cal.pro	今天 08:19	8 KB	IDL Pro...dure File	
lst_ict.pro	今天 08:19	2 KB	IDL Pro...dure File	
lst_prep.pro	今天 08:19	5 KB	IDL Pro...dure File	
lst_radcalib.pro	今天 08:19	9 KB	IDL Pro...dure File	
lst_reg.pro	今天 08:19	5 KB	IDL Pro...dure File	
lst_update_history.pro	今天 08:19	3 KB	IDL Pro...dure File	
percentiles.pro	今天 08:19	3 KB	IDL Pro...dure File	
read_lst.pro	今天 08:19	10 KB	IDL Pro...dure File	
sdi_fix_missing.pro	今天 08:19	6 KB	IDL Pro...dure File	
sdi_ind_spike.pro	今天 08:19	5 KB	IDL Pro...dure File	
sdi_prep.pro	今天 08:19	15 KB	IDL Pro...dure File	
wst_fix_missing.pro	今天 08:19	5 KB	IDL Pro...dure File	
wst_ind_spike.pro	今天 08:19	5 KB	IDL Pro...dure File	
wst_prep.pro	今天 08:19	13 KB	IDL Pro...dure File	

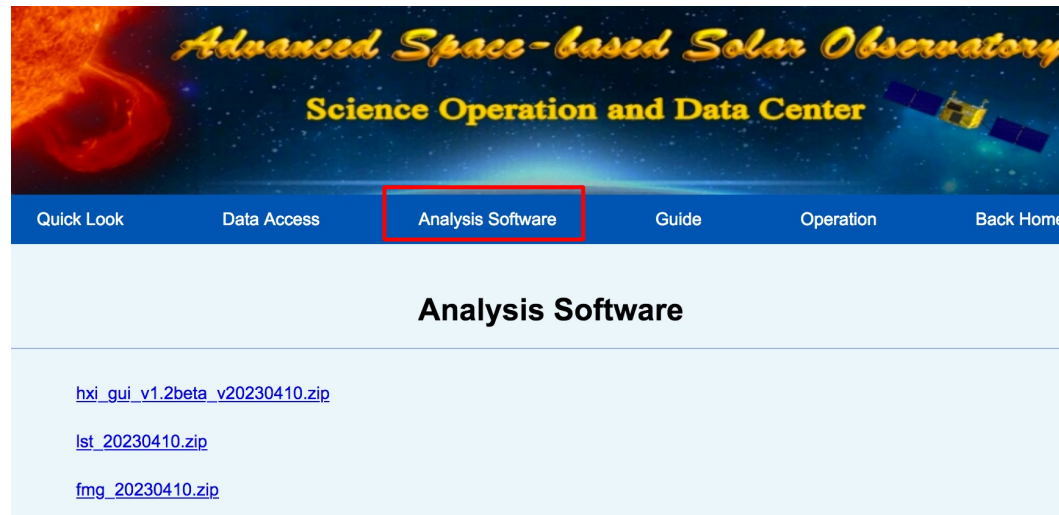
HXI

HXI_GUI_v1.2beta_v20230410	
data	▶
dbase	▶
hxi_env_set.pro	
hxi_get_lightcurve.pro	
idl	▶

Software Installation



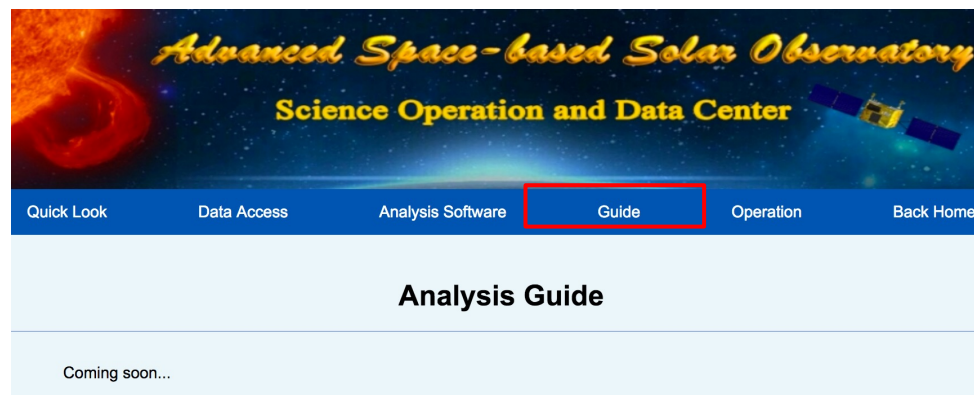
1. Access from Website



2. Access from SSW

Analysis guide

Coming soon





Thank you for your attention!

