



ASO-S Science Operation & Data Center

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2023.04.11

Outline

- Introduction
- Science Operations
- Data management and archiving
- Data processing
- Data distribution
- Summary

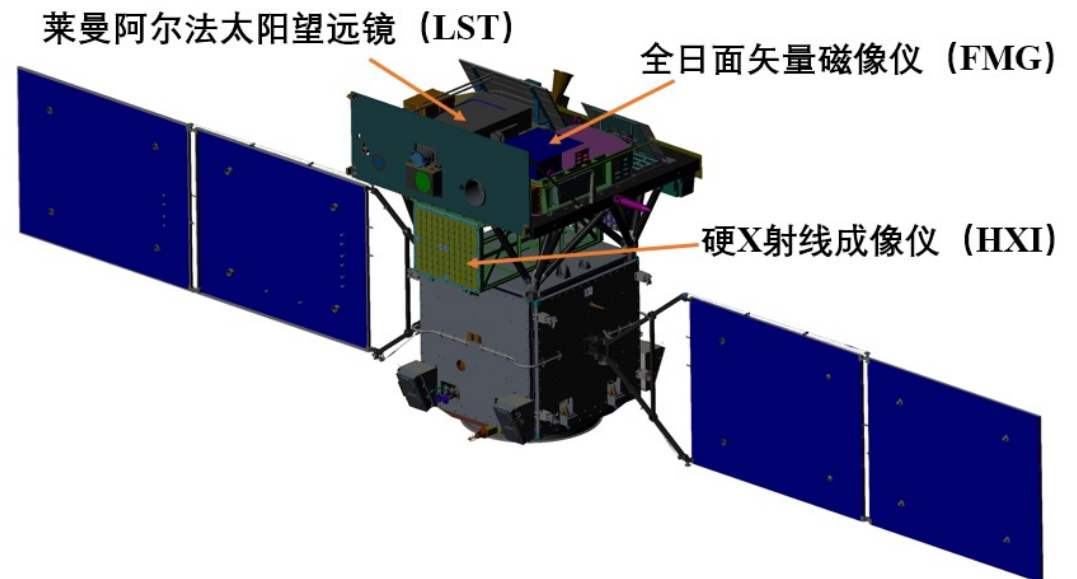
Introduction

➤ Payloads of ASO-S

- FMG: Full-disk vector MagnetoGraph
- LST: Ly α Solar Telescope
- HXI: Hard X-ray Imager

➤ Data volume

- Raw Data: ~ 500GB / day
- Processed: ~ 2TB /day



Science Operation & Data Center

➤ Science operations

- Observation planning, operation, satellite and payloads status, ...

➤ Data management

- Data from SMOC, archiving, database, data structure, data mining, ...

➤ Data processing & analysis

- Level 0 data handling, formatting, validation, calibration, QL data, high-level data production, ...

➤ User interface

- Observation proposal, data request, data search, data distribution, software distribution and update, ...

Science Operations

- Routine observation
- On-demand observation
- Calibration observation

- Emergence strategy
- Update payload configuration
- Update payload software

- SODC ➡ SMOC ➡ S/C & P/L
- Upload one-week plan

LST载荷观测计划制定 打开

仪器&观测模式参数设置

观测计划开始时间 (UTC) : 2023-03-04

WST SDI SCIUV SCIWL

WST工作模式选择: 常规模式 参数设置

观测时间设置

选择时间段 在轨压缩: 压缩

开始时间: 2023-03-04 00:01:00 持续时间: 120 分钟

结束时间: 2023-03-04 02:01:00 确定

SAA时间轴

天

持续时间 (分钟)

Title

04:48 09:36 14:24 19:12 00:00

03-04

LST载荷观测计划列表

序号	开始时间	持续时间	WST	SDI	SCIUV	SCIWL	备注
1	任意时间	10080	常规观测	常规观测	常规观测	常规观测	

观测计划浏览修改

查看&修改

删除

保存&关闭

首页 任务监视 科学计划 分发状态 产品快视 产品概览 质量监视

ASO-S 科学计划服务

科学观测计划 上传 时间过滤

文件	提交	提交时间(UTC)	处理状态	执行	操作
KX07_SP_20230327_20230326_01_01	huangyu	2023-03-26 03:39:06	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230326_20230325_01_01	huangyu	2023-03-25 06:29:52	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230325_20230324_01_01	huangyu	2023-03-24 03:52:17	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230324_20230323_01_01	huangyu	2023-03-23 03:23:58	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230323_20230322_01_01	huangyu	2023-03-22 02:50:53	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230322_20230321_01_01	huangyu	2023-03-21 06:12:29	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230321_20230320_01_01	huangyu	2023-03-20 04:35:36	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230320_20230319_01_01	huangyu	2023-03-19 03:03:53	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230319_20230318_01_02	huangyu	2023-03-18 02:54:38	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230317_20230316_01_01	huangyu	2023-03-16 03:25:24	已发控	上	🗑️ ✅ ❌ 🔄
KX07_SP_20230316_20230315_01_04	huangyu	2023-03-15 05:56:09	已发控	上	🗑️ ✅ ❌ 🔄

On-demand observation

WST仪器用户模式参数配置

确定

常规参数

曝光时间(毫秒):

采样间隔(秒):

滤光轮位置:

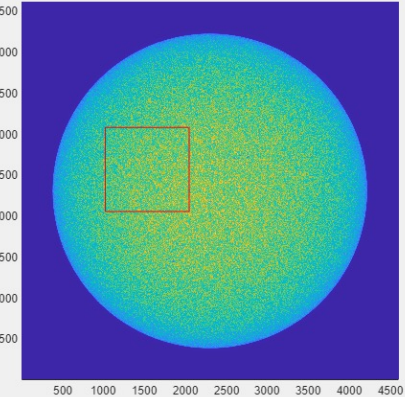
观测区域设置

图像大小:

起始行号(X):

起始列号(Y):

图像选取



Quick Look Data Access Event Catalog Operation Software

Observation Application

Notice: Please apply for 1 month in advance.

For User:

1. Apply

2. Application result

Email: Application Id:

For ASO-S Staff:

1. Apply List

Will be online after test

➤ WST & SDI

- Exposure time
- Cadence
- Observation region

Data management

- Raw Data : from S/C & P/L (6–9 times/day)
- Level 0 data : from SMOC to SODC over VPN with 350Mbps
- Archiving : from SODC to SMOC



Data levels & definition

Level	Notes		
	FMG	LST	HXI
0	(from SMOC) Data constructed from the raw telemetry stream, Unpacking, verification, splitting and splicing, format conversion with housekeeping data and keywords		
1	bad-pixel and spike-pixel removal, flat-fielding, dark current correction, and plate scale rotation and shift.	flat-fielding, dark current correction, spike map generation and bad pixel indexing	Energy calibrated
1.5	crosstalk correction	rotation, translation, scaling bad, spike pixels correction	two kinds of photon spectra with spectroscopic semi-calibration
2	line-of-sight magnetic field and intensity of active region	Images of radiometry calibration	X-ray photon spectra and X-ray images
3		Polarized brightness, CME parameters	
Q	JPG images	JPG image, daily movie	Png images of light curve, data-production status

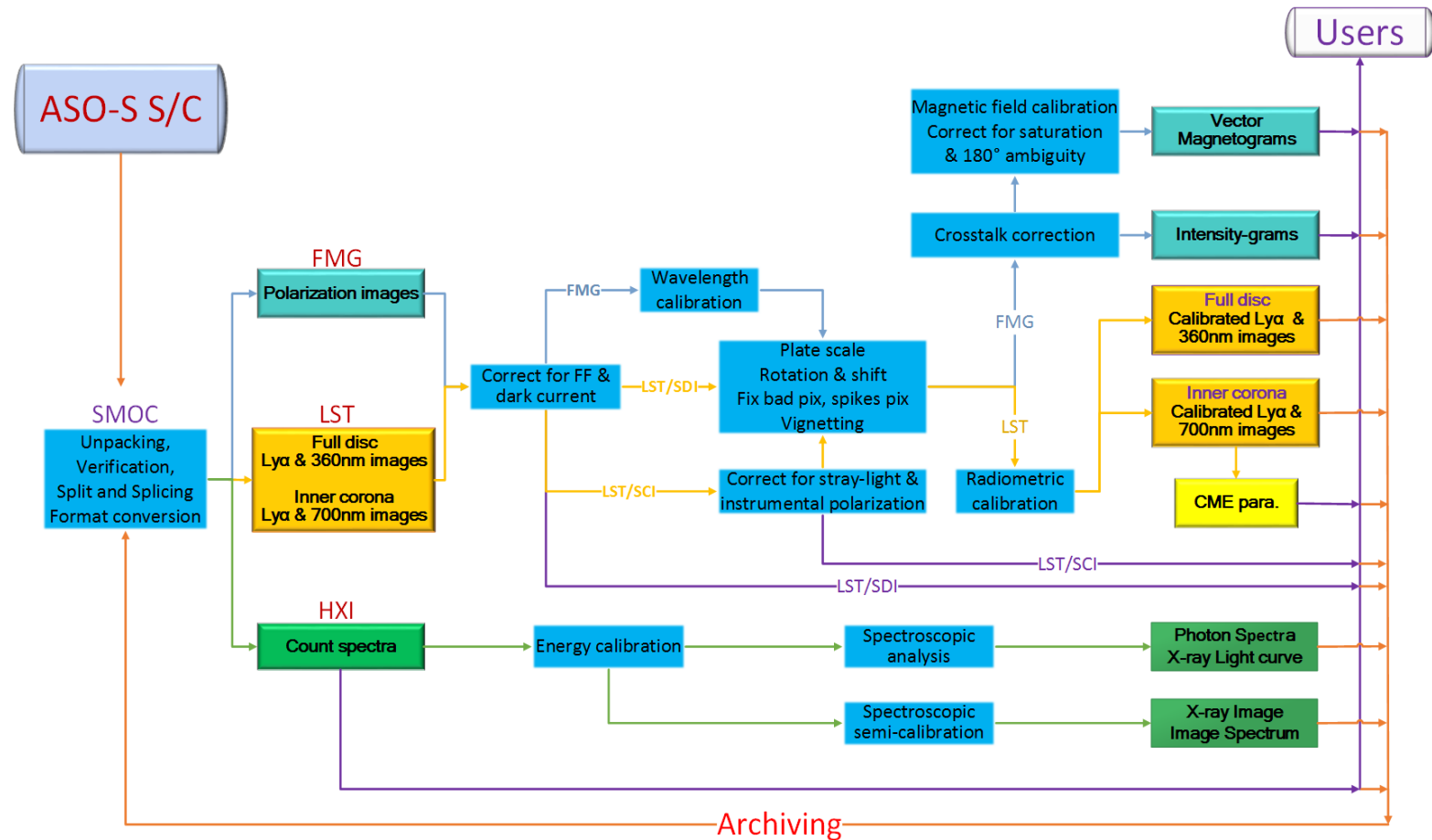
Pipeline processing

➤ Data Processing

- IDL
- C++
- FORTRAN
- MATLAB

➤ Data Analysis

- IDL/SSW



Data Distribution

- From s/c to SMOC : 2–12 hours;
- From SMOC to SODC : 4 hours
- FMG from level 0 to user : 3.5 days
- L2 data : image and longitudinal magnetic field of ARs
- LST:
 - L1 data : WST 360nm (from level 0 to user : 6 hours)
SDI 121.6nm (two days only for demo)
- HXI from level 0 to user : 2–12 hours
- L1 data : detector data

Data Distribution



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 observato... | 2022-10-11 |

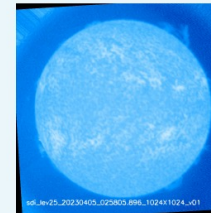
ASO-S Today (Daily images/movies)

The SDI data is between March 26, 2023 and March 27, 2023. The other data starts from April 1, 2023.

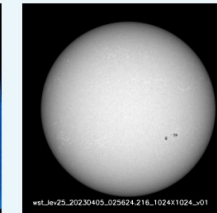
Date:

LST

SDI



WST



HXI

Data Distribution

➤ **ASO-S Website** : <http://aso-s.pmo.ac.cn/>

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 March 26, 2023 and March 27, 2023. The FMG data starts from March 27, 2023. The other data starts from April 1, 2023.

Start Time: End Time:

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:

Summary of SODC

- The observation plan function is tested;
 - Data Management: 80TB level 0 data;
 - FMG, WST, SDI, HXI data production release;
 - ASO-S website and Data Analysis software are online;
- We still welcome suggestions (aso-s.pmo.ac.cn)

Thanks!