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

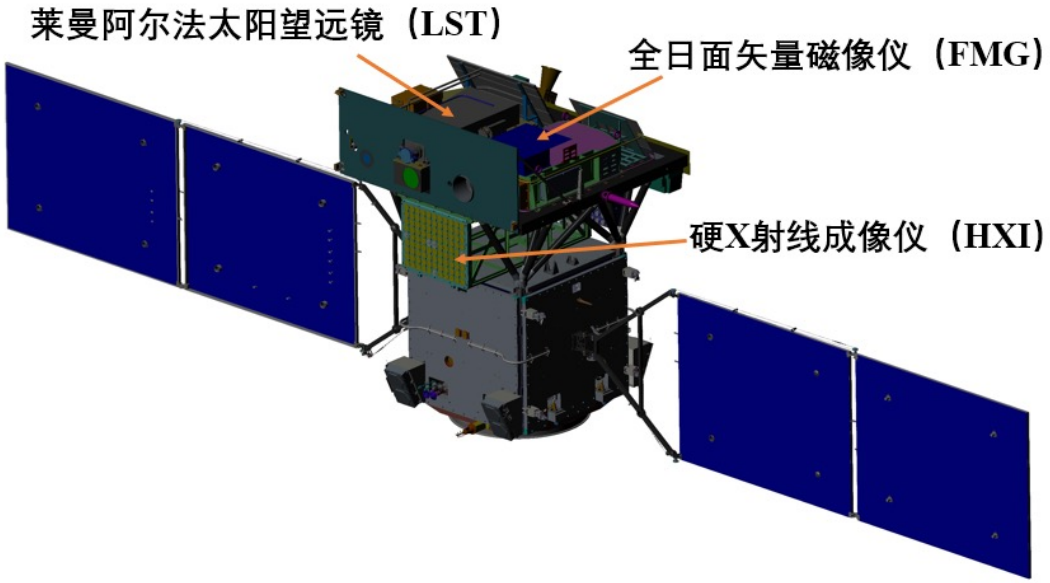
Introduction

➢Payloads of ASO-S

- FMG: Full-disk vector MagnetoGraph
- LST: Lyα 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

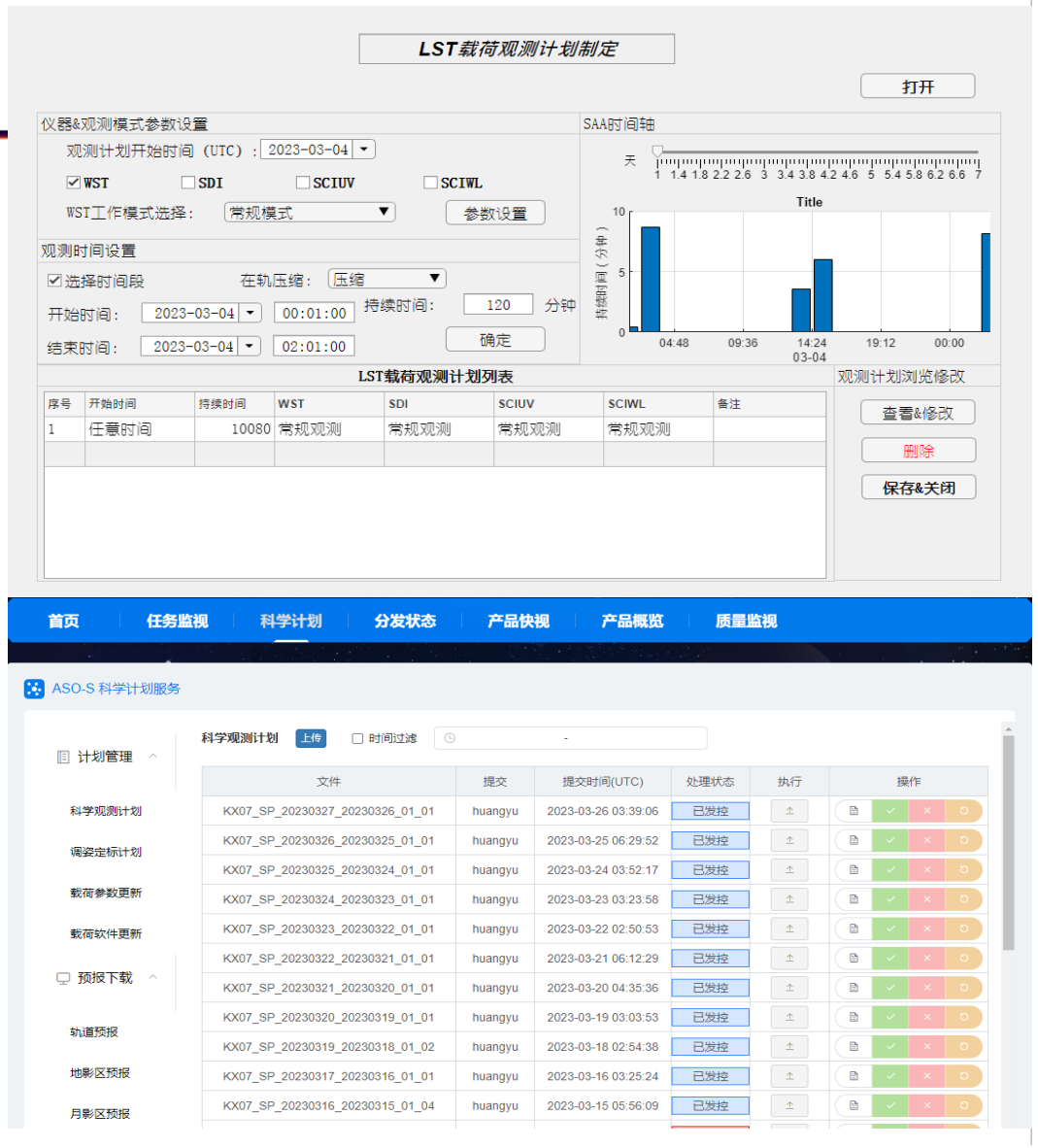
- Observation proposal, data request, data search, data distribution, software distribution and update, …

Science Operations

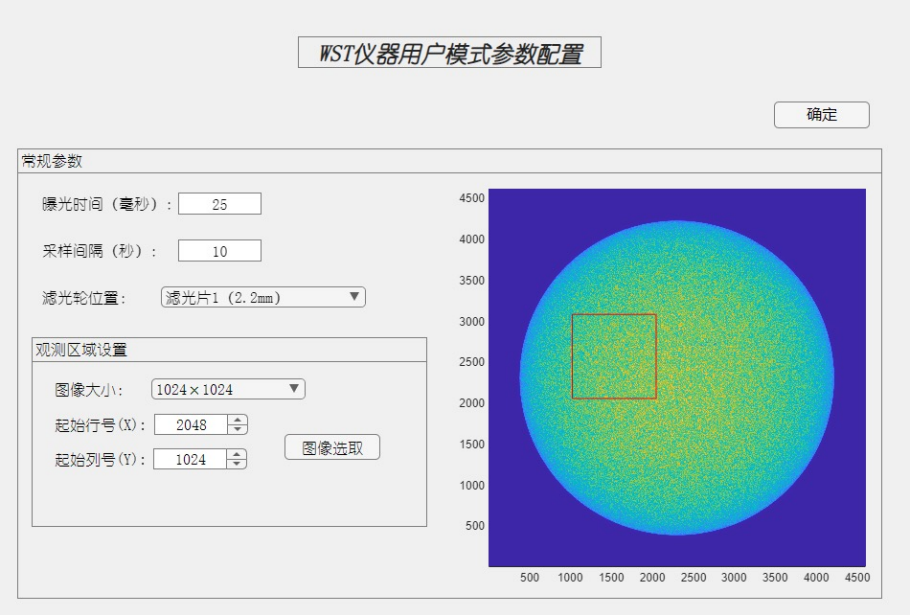
- Routine observation
- On-demand observation
- Calibration observation

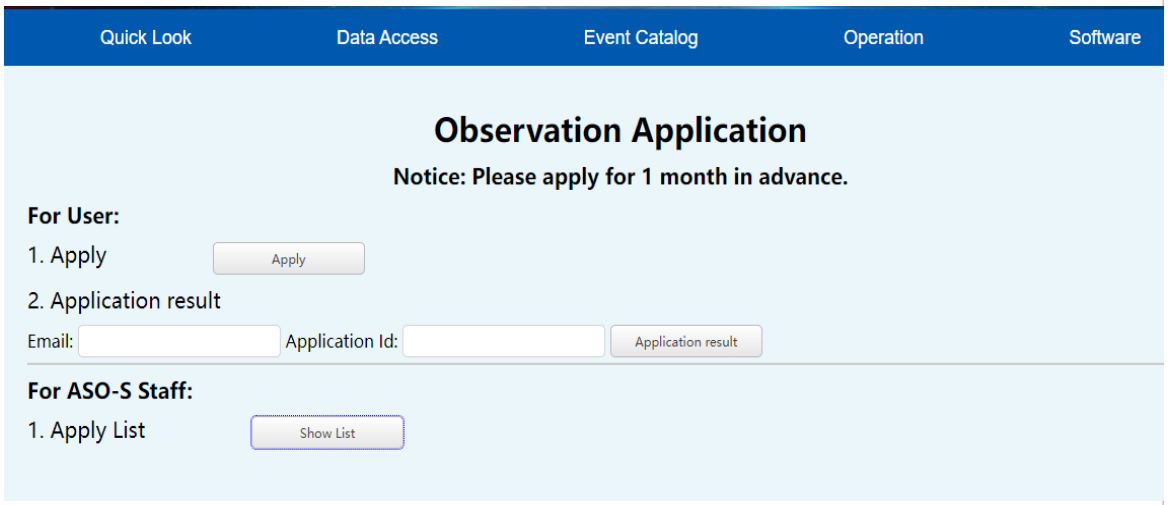
- Emergence strategy
- Update payload configuration
- Update payload software

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



On-demand observation





Will be online after test

➢WST & SDI

- Exposure time
- Cadence
- Observation region

Data management

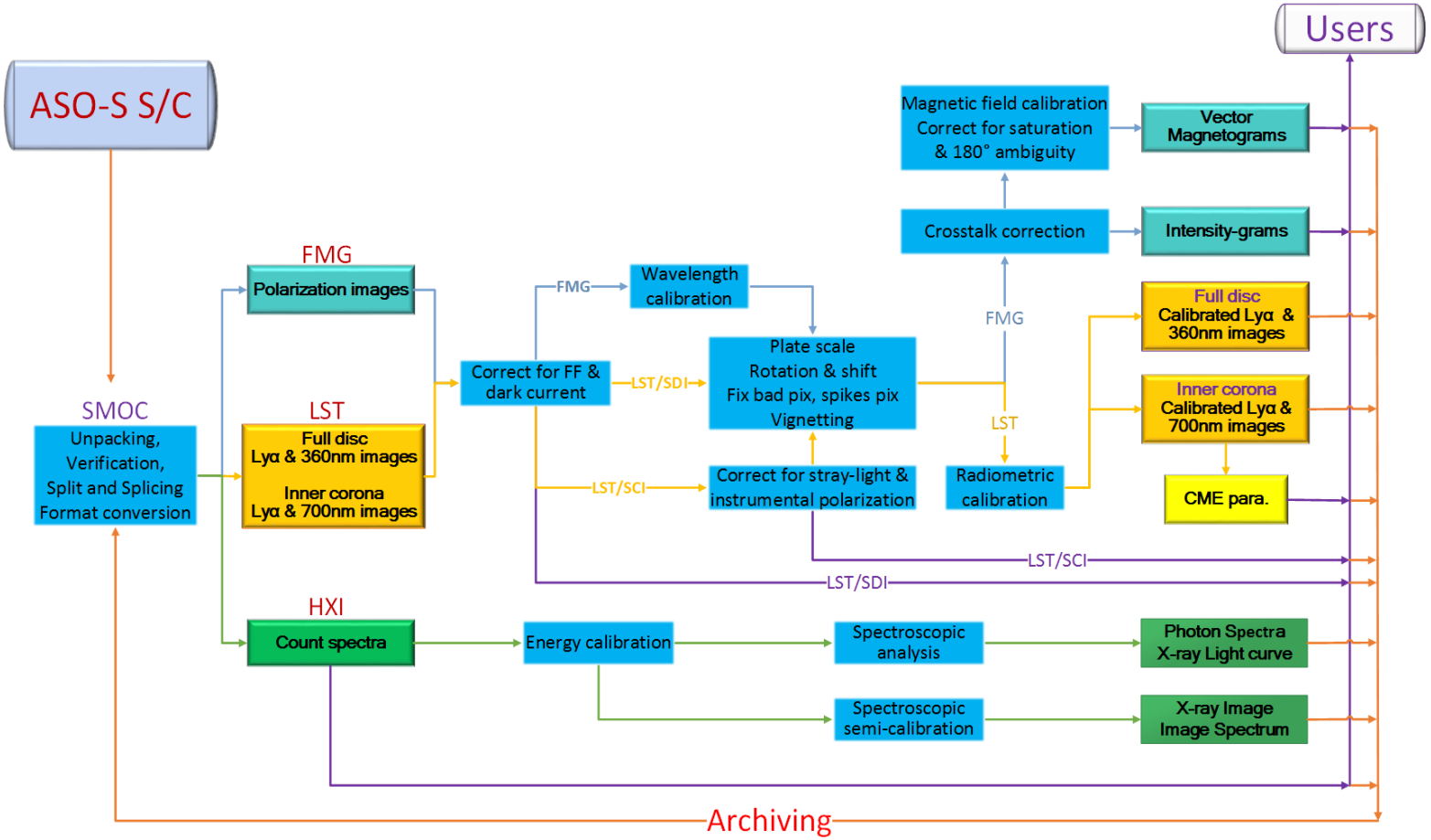
- Raw Data : from S/C & P/L (6-9 times/day)
- Level 0 data : from SMOC to SODC over VPN with 350Mbps
- Archiving : from SODC to SMOC

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



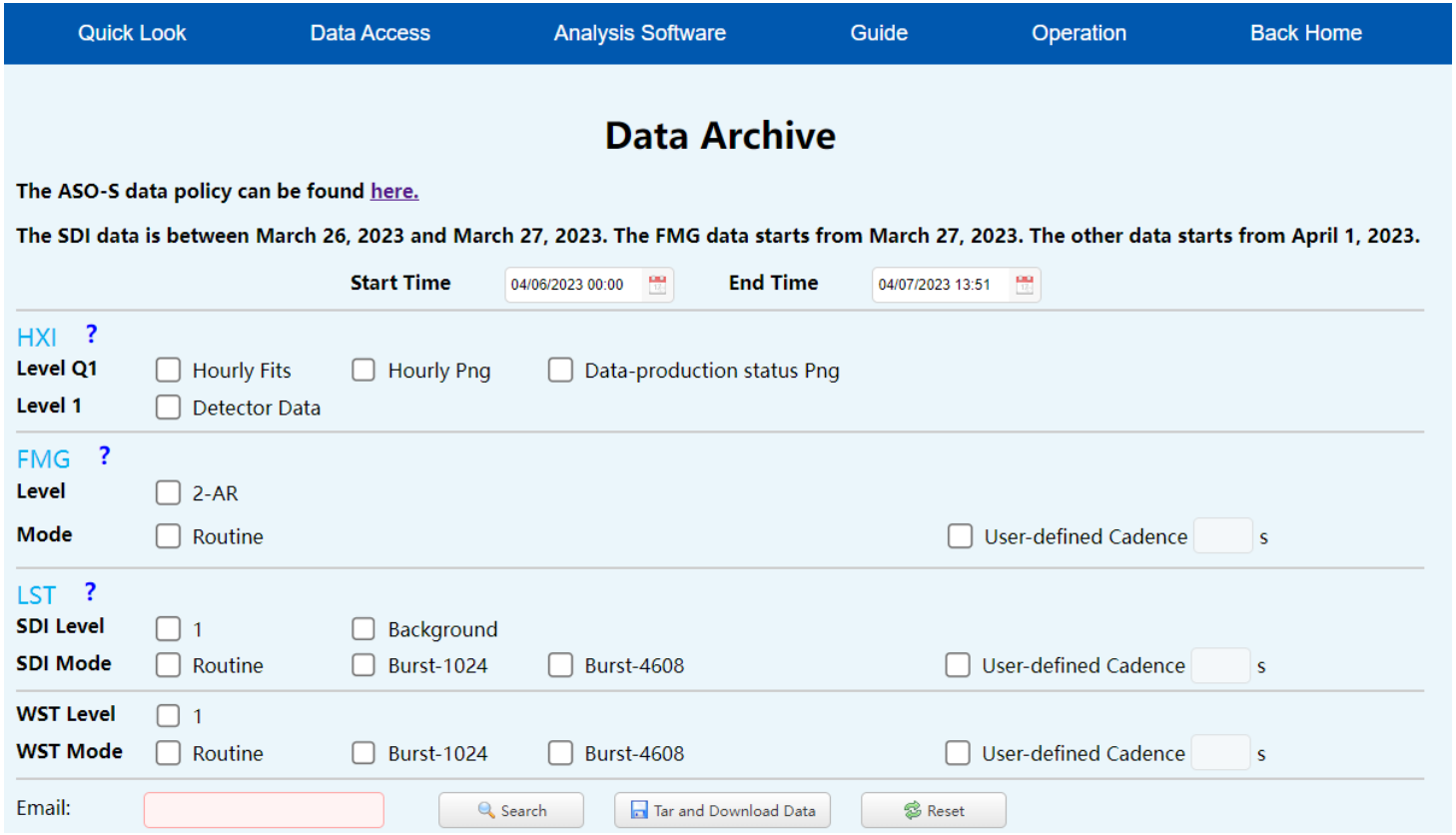
Data Distribution

- 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

Data Distribution

➢**ASO-S Website ：** http://aso-s.pmo.ac.cn/



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!