

How to use Slow-scan tools

AKARI/FIS Slow-scan Data
Reduction Workshop
@ ISAS, 2007/09/13



FIS Slow-scan data

- Format

- **TSD** (Time Series Data); FITS binary table

- Naming convention of slow-scan TSD files

- ex.

- AKARI_FIS_1200801_001/

FIS_SW_20070807143600_1770.fits.gz

FIS_LW_20070807143600_1770.fits.gz

Start time of the data in the file

Length of file [sec]

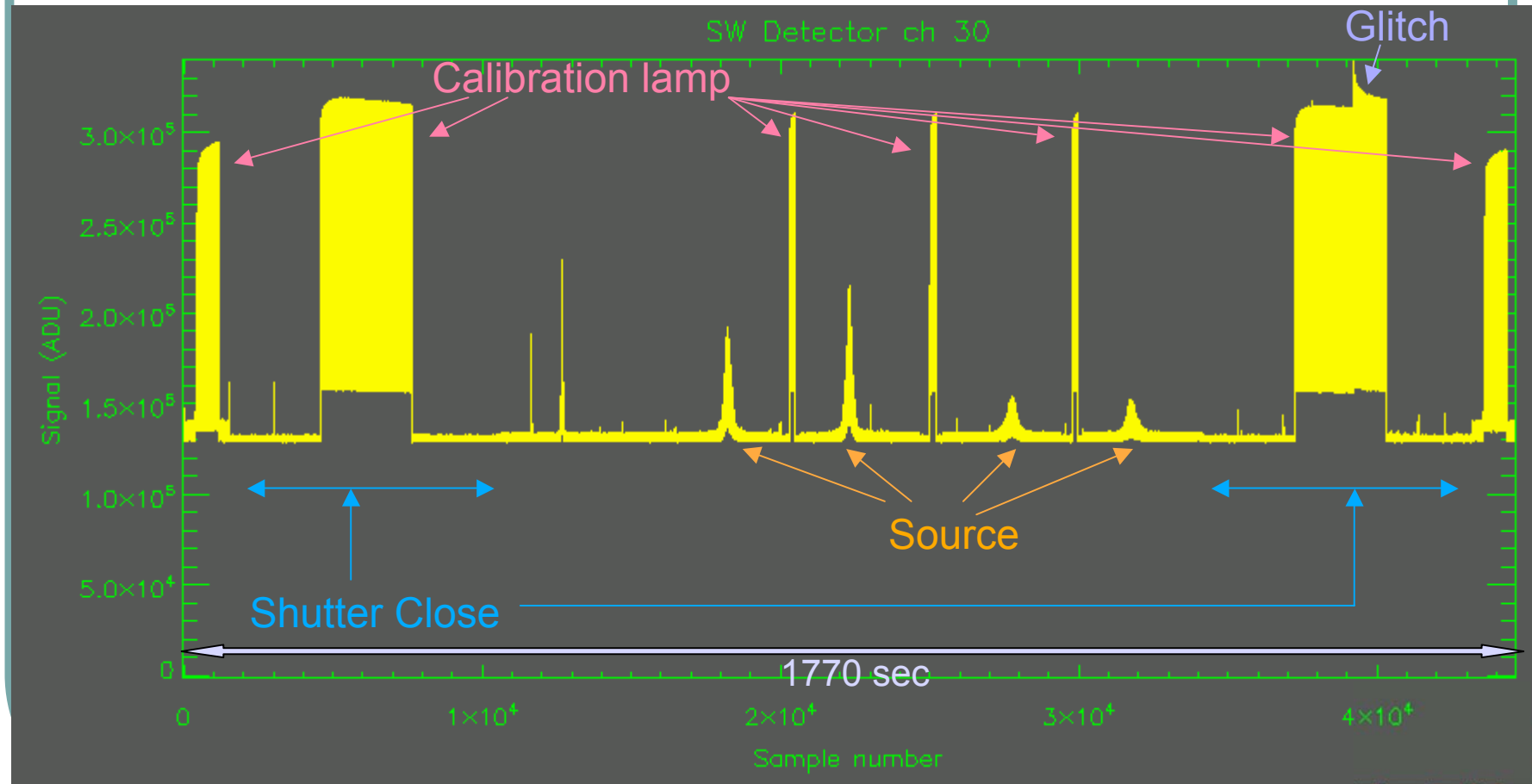
- Contents

- **Detector signals**, Positional info., Statuses of satellite & instruments, flags, etc.



Slow-scan data example in TSD file

AOT : FIS01



Displayed by FISv (TSD file viewer)



Constituents of Slow-scan tools

- Main programs

 - `/reduction/slowscan/pro/ss_run_ss.pro`

 - `/ss_init_proc.pro`

 - `/ss_make_map.pro`

 - `/...`

 - `/lib/...`

 - `/doc/...`

- Need other programs under the /reduction directory

 - GB modules – pipeline modules for all-sky survey data
 - General utilities
 - Astronomical library



Main processes of Slow-scan tools

- Discrimination of AOT (sequence pattern)
- Data (unit) conversion
- Integrated ramp curve correction `ss_init_proc`
- Fitting of integration ramps
- Detection and removal of glitches
- Responsivity correction
- Flat fielding
- Dark subtraction
- Mapping (binning) in a celestial coordinate
- Creation of image FITS `ss_make_map`



I/O Files

Input

TSD file (*.fits.gz)

ex)

FIS_SW_20070705213613_1770.fits.gz

FIS_LW_20070705213613_1770.fits.gz

Intermediate files *IDL save* files (*.sav) [and text (*.txt)]

FIS_SW(LW)_*_pr.sav, FIS_SW(LW)_*_ar.sav,

FIS_SW(LW)_*_cal.sav, FIS_SW(LW)_*_dark.sav ,

FIS_SW(LW)_*_flat.sav[, and ...]

Output

Image FITS files, *IDL save* files, and *JPEG* files

FIS_SW(LW)_*_img_w(n).fits : Intensity map

FIS_SW(LW)_*_err_w(n).fits : error map

FIS_SW(LW)_*_num_w(n).fits : sample density map

FIS_SW(LW)_*_img.jpg : map image for QL

FIS_SW(LW)_*_img.sav : IDL save file



Running ss_run_ss.pro

- Do without options **to display usage**
- Running by default
 - `>ss_run_ss, 'target_directory_name'`
 - ex1) `IDL>ss_run_ss, 'AKARI_FIS*'`
 - ex2) `IDL>ss_run_ss, '.'`
; target_dir is the current directory
- Many useful **options** are available
 - Control processing of the slow-scan tools
 - Change data treating methods



Basic options of ss_run_ss

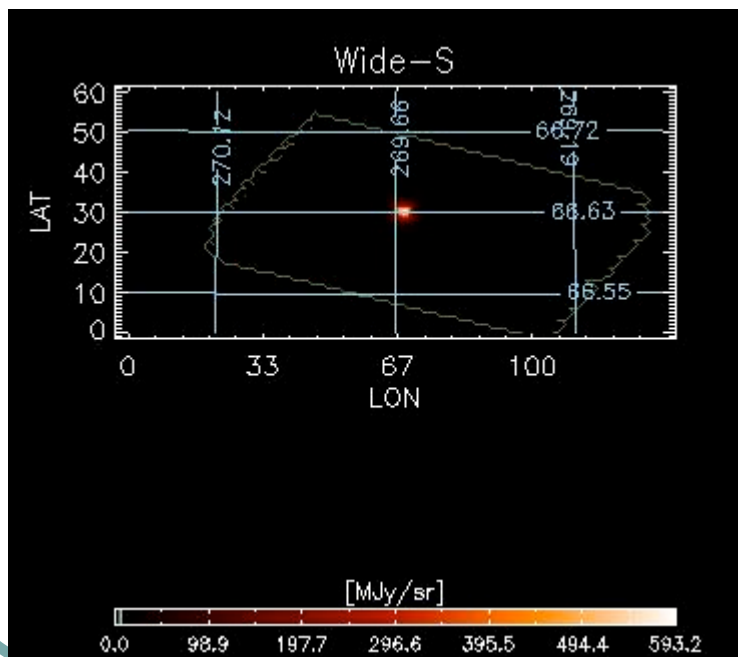
- **/INIT, /MAP**
: Do only **ss_init_proc** or **ss_make_map** process
- **/SW, /LW** : Process only for **SW** or **LW**
- **/NO_DISPLAY**
: Suppress plot display during processes
- **/GALACTIC, /ECLIPTIC** ▶
: Select **coordinate system**; Equatorial by default
- **LON(LAT)_CENTER, LON(LAT)_SIZE, GRID_SW(LW)**
: Specify mapping **region** and **grid size**
- **/CUBE_FITS** : Generates FITS as **data cube** ▶



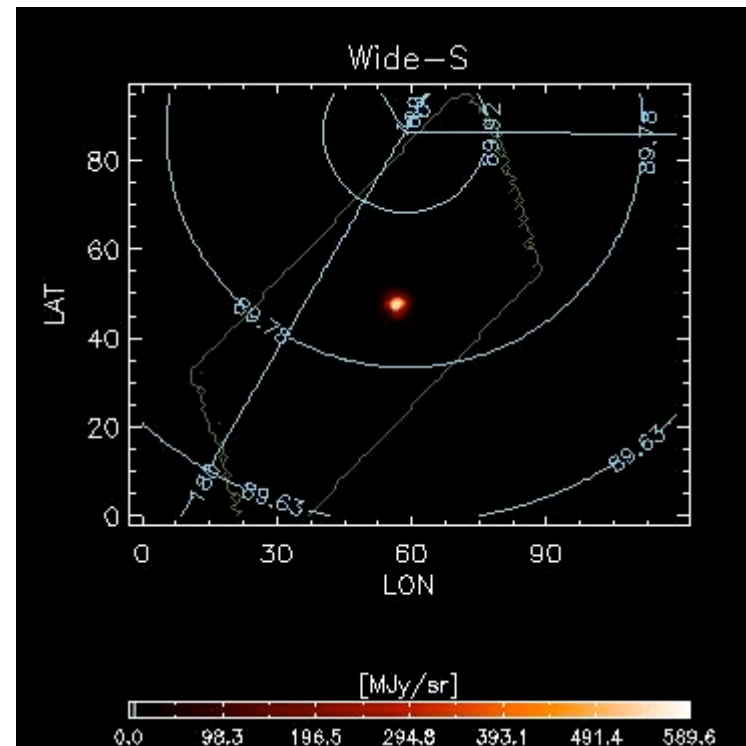
Coordinate conversion

- Equatorial coordinates by default
- /GALACTIC, /ECLIPTIC options are available

in Equatorial coordinates (default)



in Ecliptic coordinates



Option for output FITS format

- Three FITS image files (`_img`, `_err`, `_num`) are generated for each band by default.
- Creates one `*_cube` FITS file instead of three files by `/CUBE_FITS` option.

- Data cube contains three image maps.
- 'ds9' can deal with data cube FITS.

