

AKARI/FIS
1st Data Reduction Workshop
– Introduction –

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Purpose of the Workshop

- Hand on tutorial of FIS data reduction toolkit.
- Users get familiar to the FIS data and data processing.
- To encourage the users for scientific analysis.

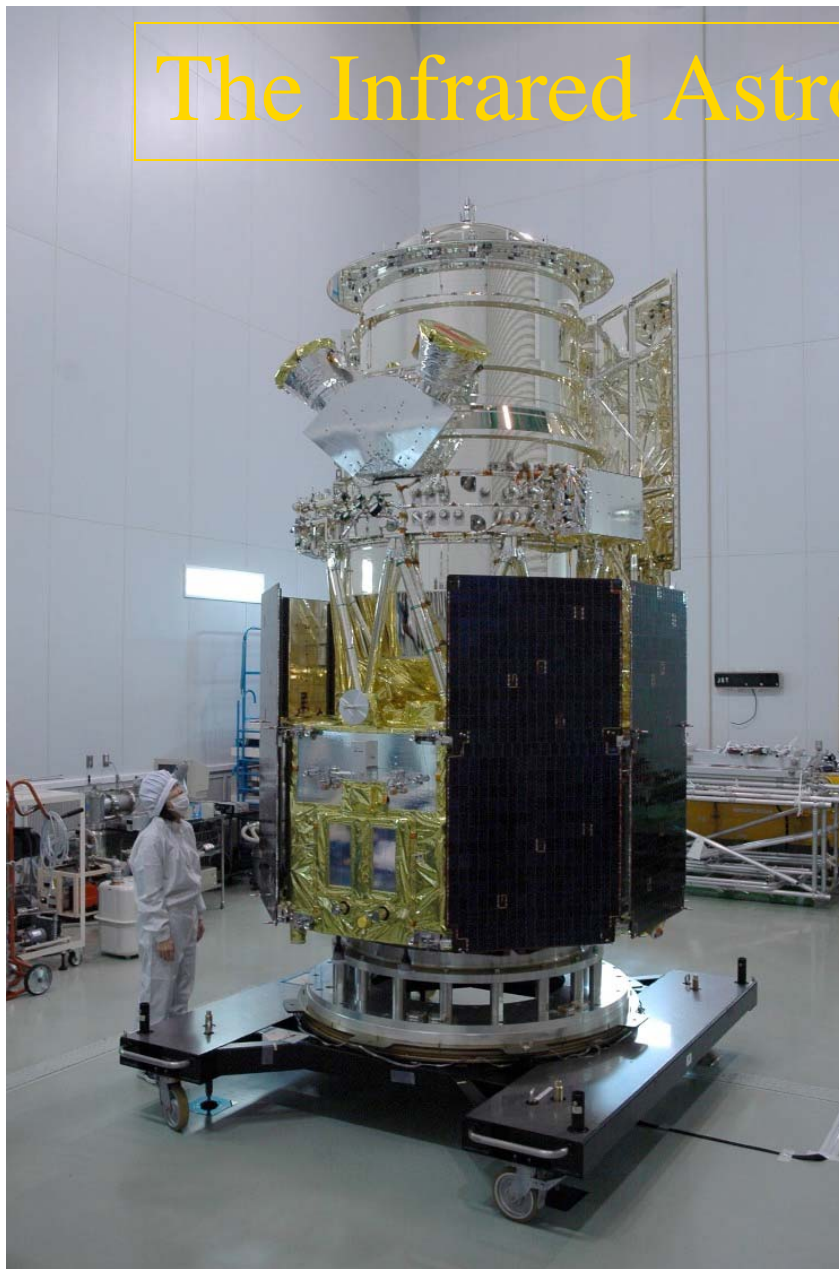
- Communication between core team and observers.



Programme (slightly updated)

- 10:30~ Introduction (AKARI status, Data archive, Data priority use, etc.)
- 10:45~ Introduction to the FIS data reduction
<Preparation for user's practice>
- 11:30~ FIS Data reduction demonstration
- 12:00~ User's practice
<Lunch>
- 13:30~ Advanced course (options, recipes, caveats)
Discussion
- 15:00~ Workshop closed.

The Infrared Astronomical Satellite AKARI



<http://www.ir.isas.jaxa.jp/AKARI/>

2006 Feb. 22 06:28 JST Launch!



FIS Obs. completed!

- The cryogen, liquid Helium boiled off at 08:33, August 26th (UT).
- Accordingly the temperature of the FIS started increasing, and the detector signal saturated.
- The instrument retrieved the data for another a day, and switched off at 08:15, August 27th (UT).
- FIS All-Sky Survey completed for 94 % of the entire sky scanned more than twice.



Data Release

- Now all data until the end of Phase 2 are on the DARTS archive.
- Current version is “Data Release 1” (DR1).
- Data Release 2, slightly changed in data format + processing with the latest pipeline will be available (hopefully) in October.



DARTS (ObsLog)

Data Archives and Transmission System

DARTS ISAS PLAIN ISAS JAXA

Astrophysics		Solar Physics		Solar-Terrestrial Physics			
AKARI	SUZAKU	HALCA	ASCA	IRTS	GINGA	TENMA	JUDO

[Help \(EN\)](#) , [\(JP\)](#)

AKARI OBSLOG

Maximum number of output rows Output is sorted by

[Pattern Match](#) (wildcards: use _ as a single character, % as any number of characters)

OBSID e.g. "1210016-001", "12100%"

Proposal ID e.g. "FIS", "CL"

[Observation Date](#)

Start End

[Select Multi Values](#)

Proposal ID

AOT

Status

Observed STT err P3PV

Data lost SH Scheduled



DARTS/Search Results

Search Result

- The number of display 13 / The number of hits 13
- Output ALL hit records : select an output format.
 HTML (display on browser) CSV VOTABLE PLAIN TEXT
- Download data : select checkboxes and then push "WGET SCRIPT" button.

Status and Colors

IRC Data	Data lost	SafeHold mode	Observed	Processed	Scheduled
FIS Data			Observed	Processed	Scheduled

NO	SELECT	FTP	DATE ↓↑	TIME ↓↑	OBSID ↓↑	OBJECT ↓↑	OBSERVER ↓↑	PROPOSAL ↓↑	AOT ↓↑	AOTPARAM ↓↑	STATUS ↓↑	PKGFSIZE ↓↑
1	<input checked="" type="checkbox"/>	ftp	2007-08-01	00:09:12	1711107-001	IRAS 15477+3943	Yamamura Issei	MLHES	FIS01	2.0;8;70	Observed	33756.8
2	<input checked="" type="checkbox"/>	ftp	2007-08-02	20:00:29	1711002-001	IRAS 03172-2156	Yamamura Issei	MLHES	FIS01	2.0;8;70	Observed	33750.9
3	<input checked="" type="checkbox"/>	ftp	2007-08-06	11:03:34	1711041-001	IRAS 15255+1944	Yamamura Issei	MLHES	FIS01	1.0;15;70	Observed	33708.7
4	<input checked="" type="checkbox"/>	ftp	2007-08-11	01:02:08	1711106-001	IRAS 02143+4404	Yamamura Issei	MLHES	FIS01	1.0;15;70	Observed	33749.9
5	<input checked="" type="checkbox"/>	ftp	2007-08-14	18:35:21	1711078-001	IRAS 02302+4525	Yamamura Issei	MLHES	FIS01	1.0;15;70	Observed	33732.1
6	<input checked="" type="checkbox"/>	ftp	2007-08-15	23:02:13	1711012-001	IRAS 03463-0710	Yamamura Issei	MLHES	FIS01	1.0;15;70	Observed	33730.6
7	<input checked="" type="checkbox"/>	ftp	2007-08-15	21:00:53	1711305-001	IRAS 01144+6658	Yamamura Issei	MLHES	FIS01	1.0;15;70	Observed	34027.9
8	<input checked="" type="checkbox"/>	ftp	2007-08-15	17:39:45	1711293-001	IRAS 00102+7214	Yamamura Issei	MLHES	FIS01	1.0;15;70	Observed	33824.5
9	<input checked="" type="checkbox"/>	ftp	2007-08-18	02:29:36	1711010-001	IRAS 04020-1551	Yamamura Issei	MLHES	FIS01	1.0;15;70	Observed	33718.5
10	<input checked="" type="checkbox"/>	ftp	2007-08-18	13:50:37	1711602-001	IRAS 03019+3838	Yamamura Issei	MLHES	FIS01	1.0;15;70	Observed	33780.6
11	<input checked="" type="checkbox"/>	ftp	2007-08-20	11:50:30	1711126-001	IRAS 16457+4219	Yamamura Issei	MLHES	FIS01	2.0;8;70	Observed	33722.8
12	<input checked="" type="checkbox"/>	ftp	2007-08-20	15:05:25	1711221-001	IRAS 16255+2801	Yamamura Issei	MLHES	FIS01	2.0;8;70	Observed	33747.9
13	<input checked="" type="checkbox"/>	ftp	2007-08-24	17:26:27	1711603-001	GK Per	Yamamura Issei	MLHES	FIS01	1.0;15;240	Observed	33761.6



Prioritized data usage

- Open Time observations
 - One year after the end of Phase 2 (= announce was made on Aug. 28), or when the data are available on the archive.
- Large Area Survey (LS) / Mission Programme (MP)
 - One year after the date when data are available on the archive.
- When prioritized period expires.
 - gpg key will be replaced by simple gzip.
- Clock has not been started for FIS03 (FTS) and IRC11 (Slow-scan) data.

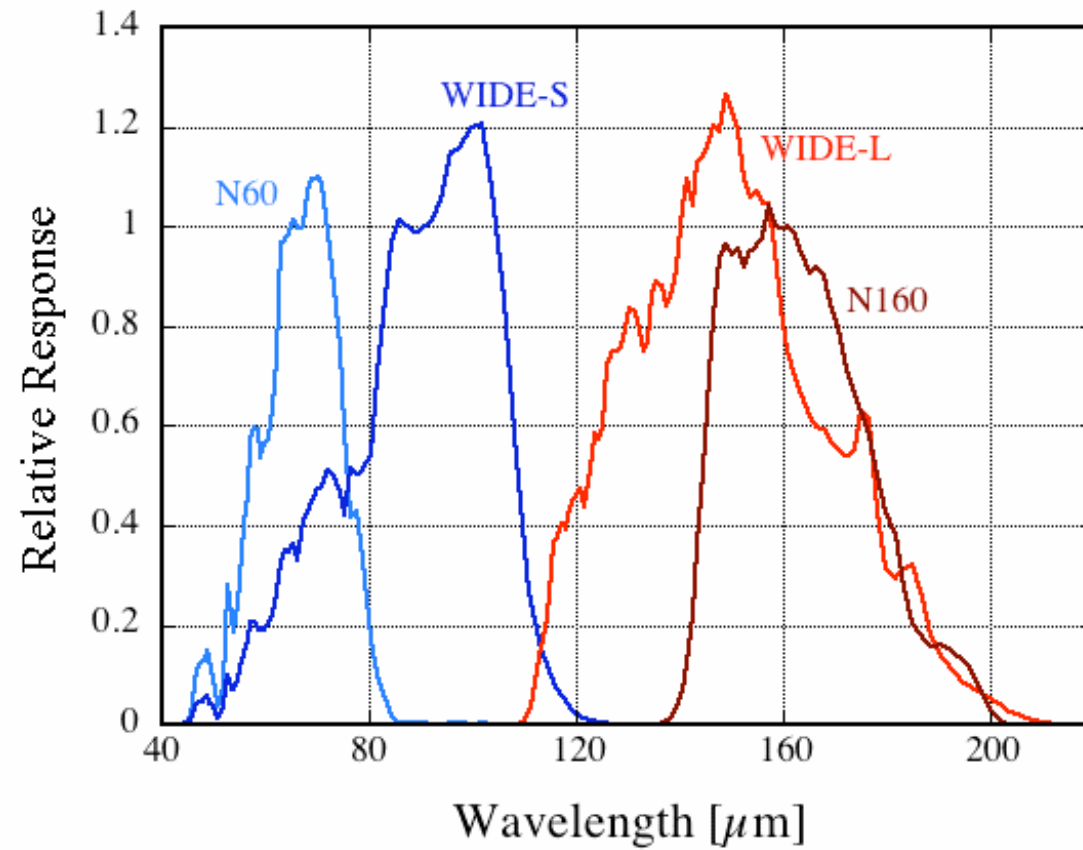


FIS Photometric Mode

Band	N60	WIDE-S	WIDE-L	N160	
Wavelength	50–80	60–110	110–180	140–180	[μm]
Central Wavelength	65	90	140	160	[μm]
Detector	Monolithic Ge:Ga		Compact Stressed Ge:Ga		Ge:Ga chips supplied by NICT
Readout	Charge Trans-Impedance Amplifier (CTIA)				
Array format	20 x 2	20 x 3	15 x 3	15 x 2	Pixels
Pixel size (Physical size)	27 x 27 (0.5 x 0.5)	27 x 27 (0.5 x 0.5)	44 x 44 (0.9 x 0.9)	44 x 44 (0.9 x 0.9)	[arcsec ²] ([mm ²])



FIS RSRF





FIS Detectors

WIDE-S: 3x20

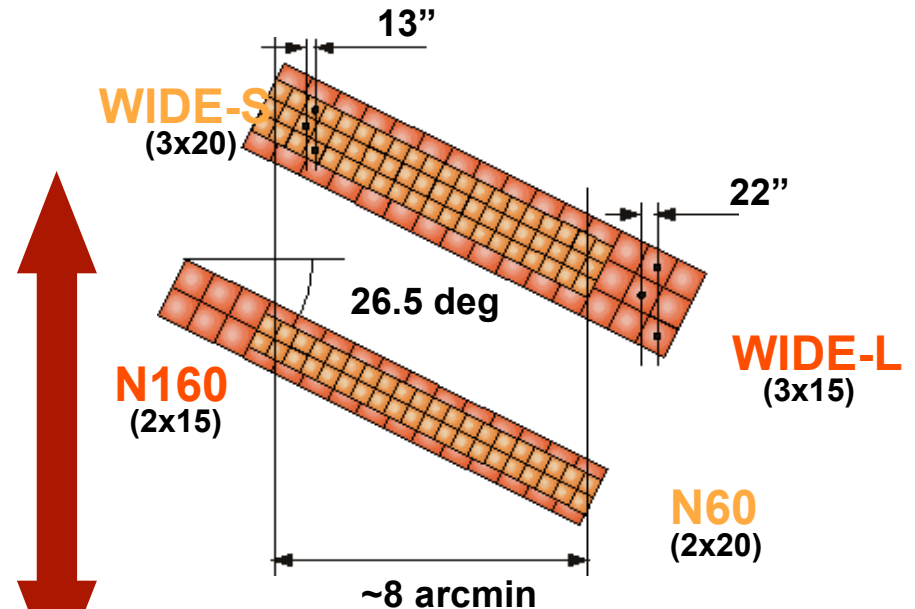
N60: 2x20

N160: 2x15

WIDE-L: 3x15

Overlap each other

Scan Direction



- 44.2" x 44.2" / pixel
- 26.8" x 26.8" / pixel

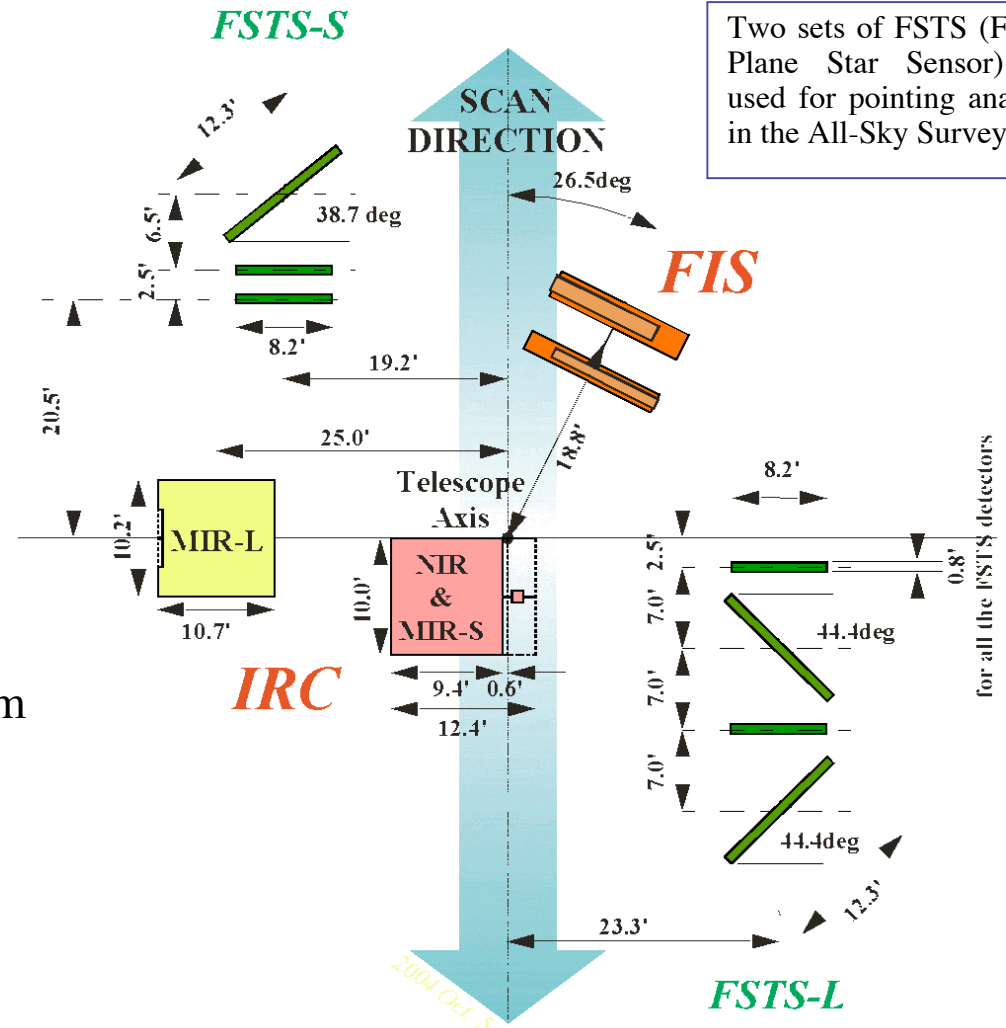
FoV of the FIS



Field of View

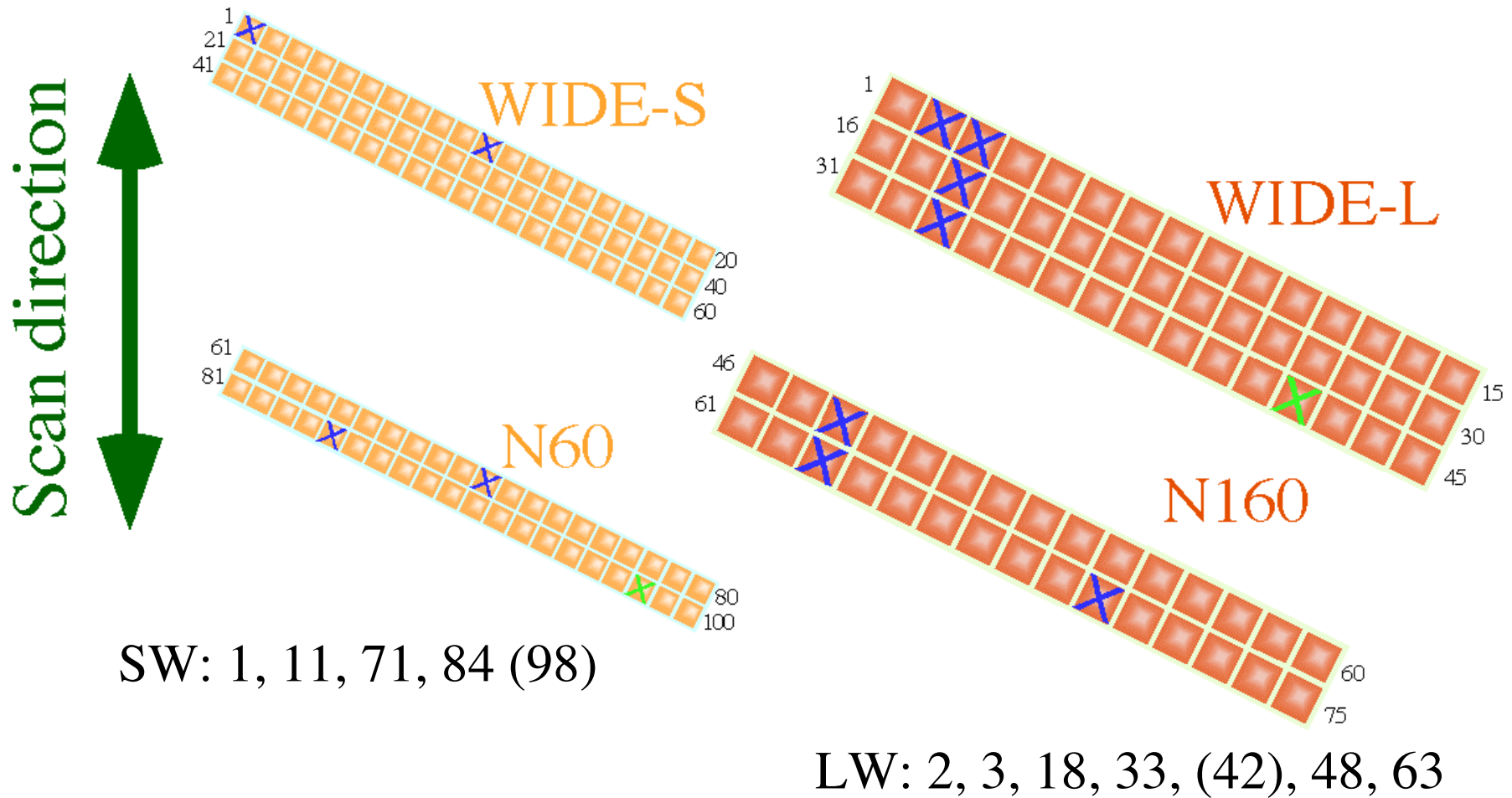
- Three apertures
 - FIS (SW + LW)
 - IRC (NIR + MIR-S)
 - IRC (MIR-L)

- All instruments *can* be operated simultaneously.
 - Three apertures look at different areas of the sky.
 - FIS two channels share the same area of the sky by beam splitter.
 - IRC NIR and MIR-S share the same area of the sky by beam splitter.



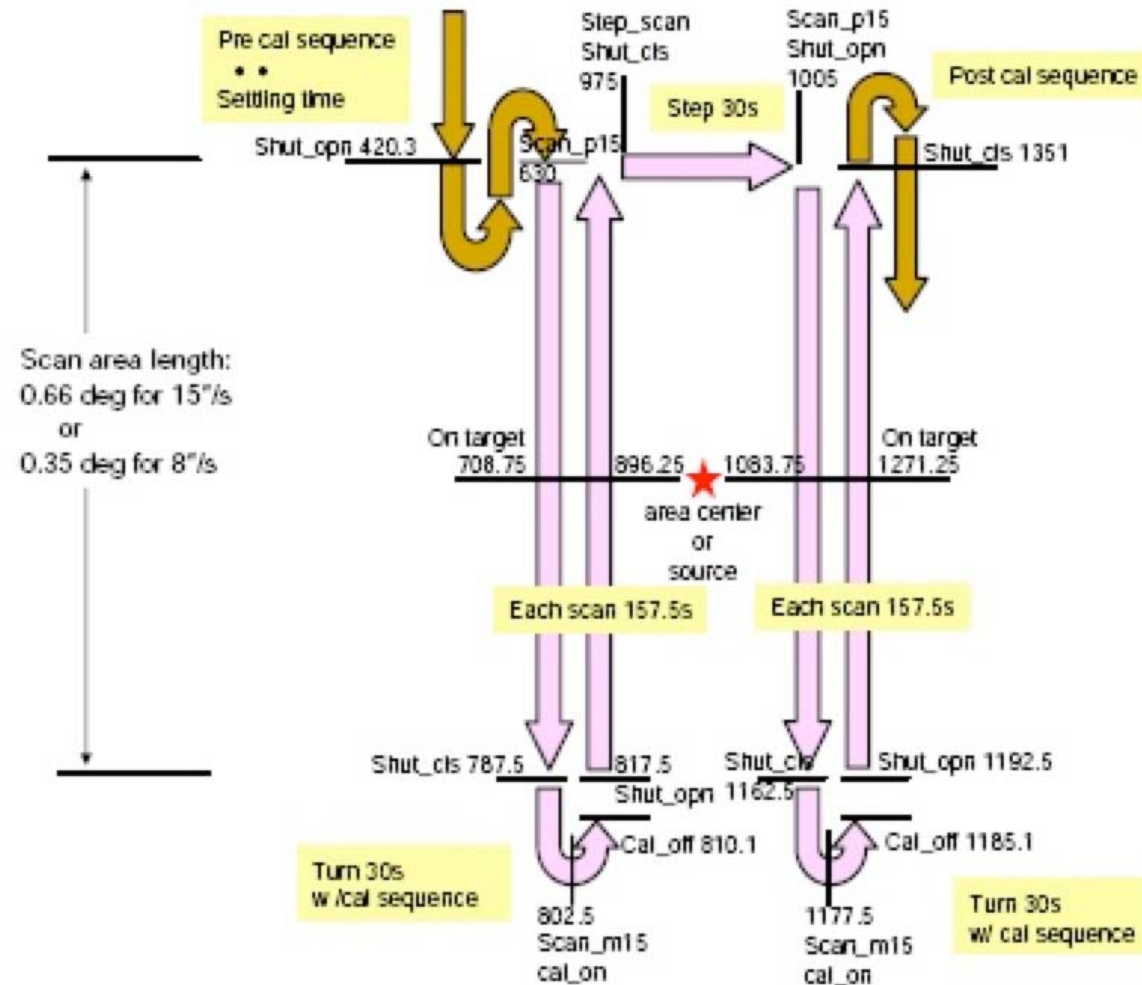


Dead pixels



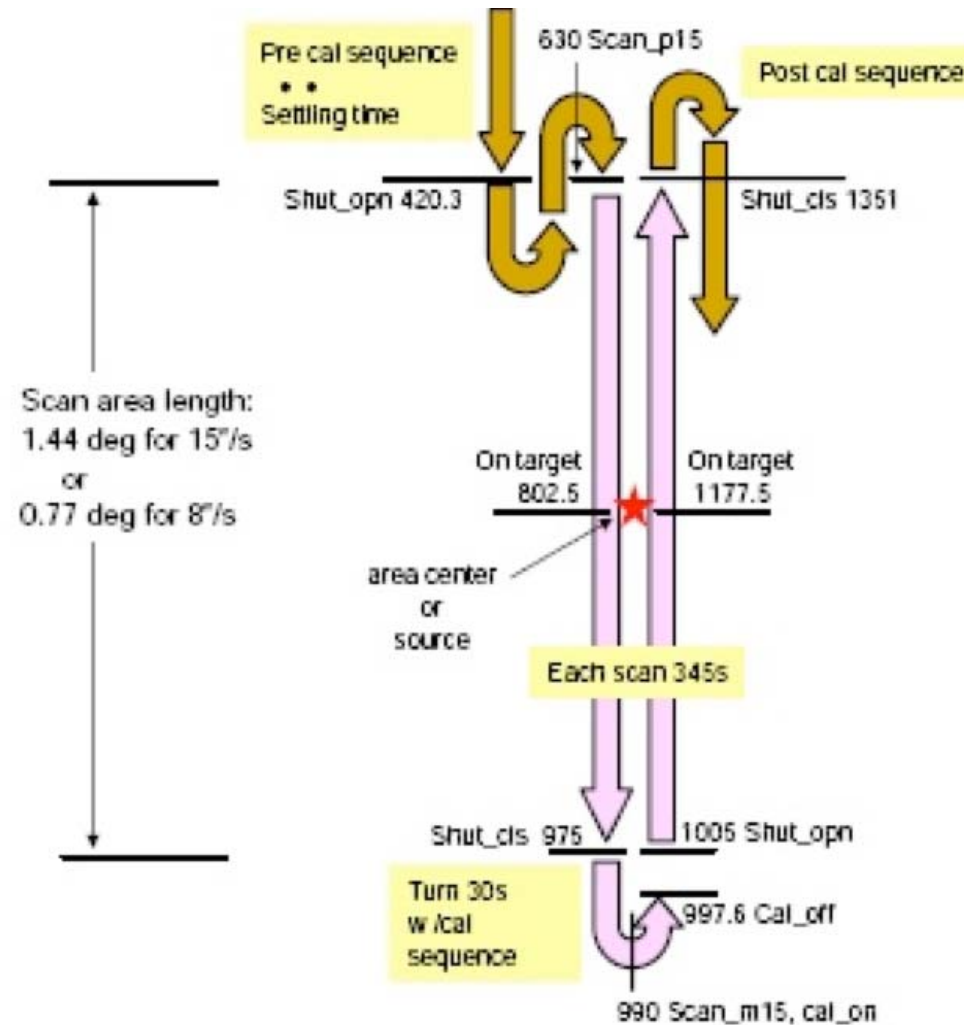


Observation Sequence (FIS01)



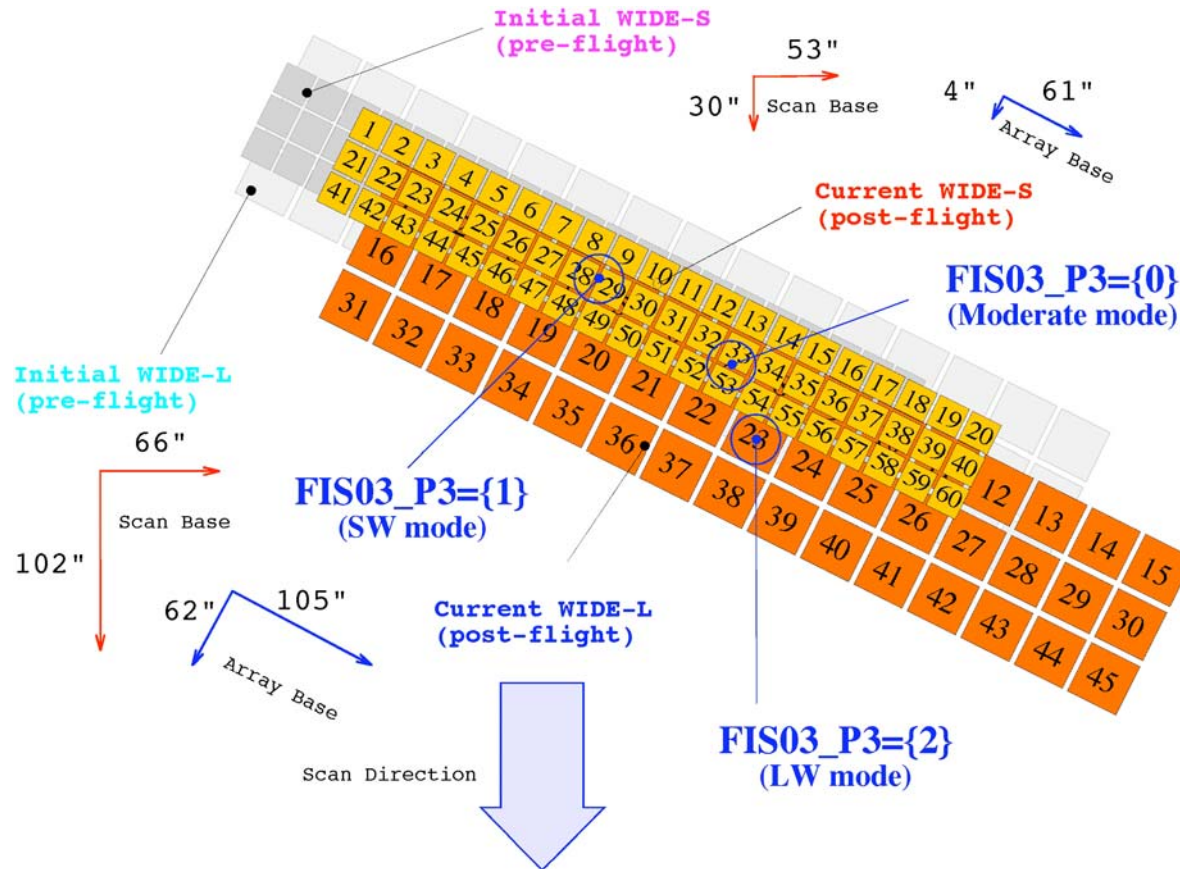


Observation Sequence (FIS02)





Detector Alignment (FTS)



- Corresponding information not yet available for the Slow-Scan mode.



Time Series Data (TSD)

- The FIS detectors are continuously sampled with ~ 25 and ~ 16 Hz for SW & LW, respectively, while the telescope scans the sky.
- The FIS ‘raw’ data is in the dedicated format called ‘TSD’, a table FITS format.
- Interface to the TSD FITS files and data browser are distributed in the software package.



TSD Format

TSD Branch	Time	Status (boolean)	Telemetry (analog)	Detector Data (analog)	Flags (boolean)	Quality	Counter
	Non-Editable			Editable			
FIS_OBS				det	flux ferr	frame flags pixel flags	
FIS_HK							
IRC_HK							
HK_2							
AOCU							
GADS							
PR							
SE							



Attitude determination

- Two levels
 - Onboard determination by the AOCU (Attitude and Orbit Control Unit).
 - Ground-base attitude determination system (G-ADS)
- G-ADS supposed to be more reliable.
- Focal-plane pointing reconstruction is only made for the All-Sky Survey data.
- Current status:
 - G-ADS data delivered for all observation periods.
 - Current data (DR1) only have the latest G-ADS processing results after mid-December 2006. Older version for August to mid-December, 2006
 - DR2 will have the latest G-ADS information.
 - G-ADS has about 60 arcsec offset from the 'true' position.



FISv (data browser)

FISv - FIS Data Visualizer

File Main Tools Pipeline Help

/iris/af09/work/yamamura/test/AKARI_FIS_5110085_001/FIS_SW_20070705213613_1770.fits.gz

X axis: Sample#

Y axis: Time, Status

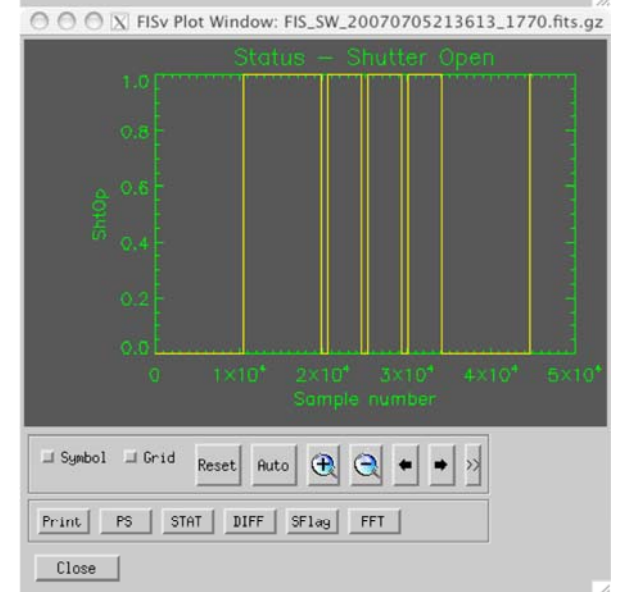
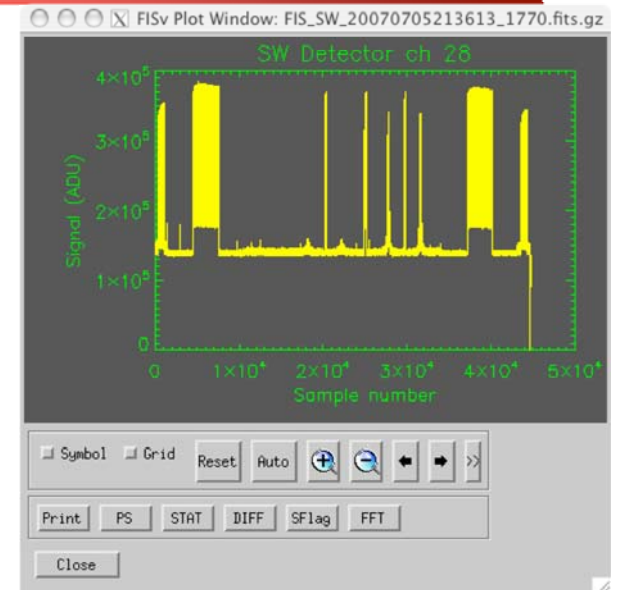
Time: AFTIME, PINTIORG, FISTIORG, PIMTI, FISTI

Status: CREOn, ShtOp, FlwposOn, Flwpos_B1, Flwpos_B0, MposOn, Mpos_B1, Mpos_B0, RstWideL0n, RstWideS0n, RstN1700n, RstN600n

Plot Table Print PS

Header View Plot All
Image of det Masked Plot
TSD Editor
GB Batch GB FlagBad
GB Cnv2V GB Diff

X:Sample#, Y:RstCntWideS
X:Sample#, Y:CalPlsCntB
X:Sample#, Y:ShtOp





FIS01 Detector data

