SCI-ON Calibration

SCI-on summary

		Gain (CTI. Trail, etc.)	RMF (line spread func.)

Normal /Burst	FI	•Obs. until Feb. 2007
		    –OK
		•Obs. After Feb. 2007
		    –Time evolution is under study. The study will be completed by Jan. 31.
			Same as that for just after the launch.
			Recent data suggest an additional width of ~30eV.
			RMF will be upgraded by Jan. 31.

	BI	Same as FI.	
1/4 window	FI	Same as for the normal mode, but recent data suggest a slightly lower gain.	Same as for the normal mode.
	BI	Same as FI.	

# SCI-on Charge Transfer Inefficiency (CTI)

The SCI makes the positional dependence of the CTI complicated. ("The saw-tooth structure").
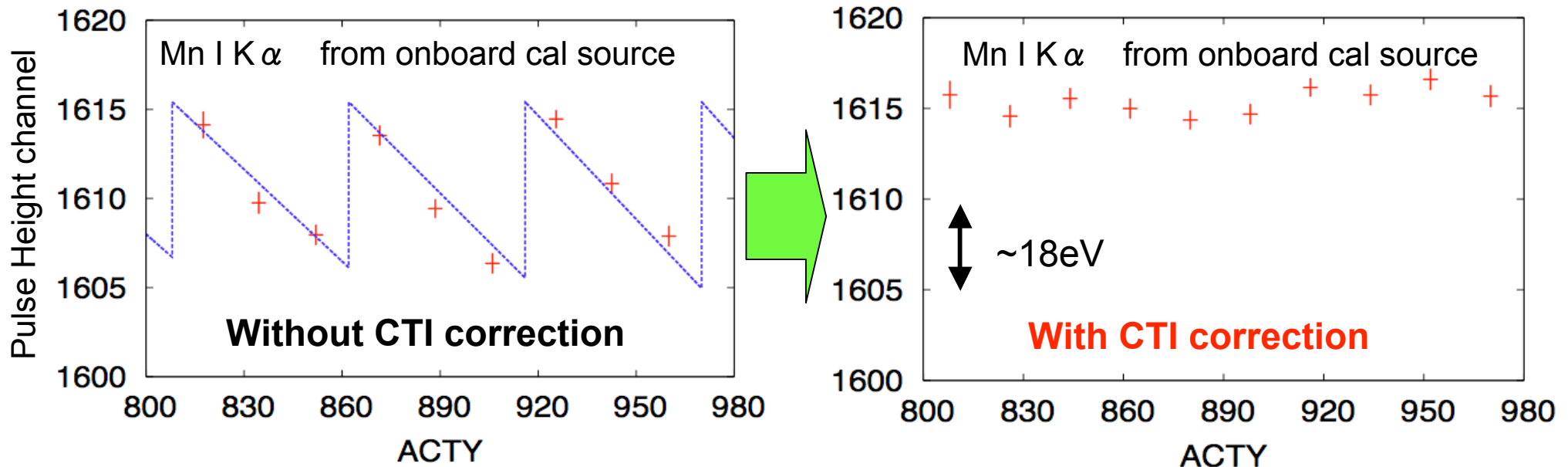
- **With the CTI correction, the positional dependence until 2007 Feb. is less than 5eV @ 5.9 keV**

- Positional dependence in the low energy band (~1keV) is probably OK but not checked well.

- Positional dependence after 2007 Feb. is less than 8eV@5.9keV.

SCI-on Gain

- Checked by the cal source (55Fe), Peruses cluster, IC443 and E0102.

- **Inaccuracy of the energy scale until 2007 Feb. is less than ~10eV.**
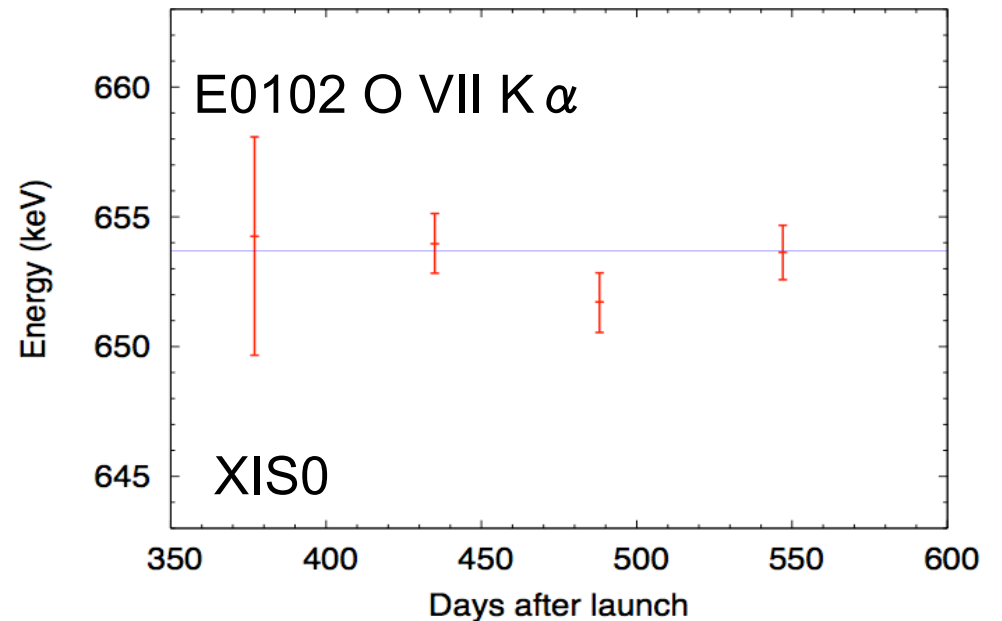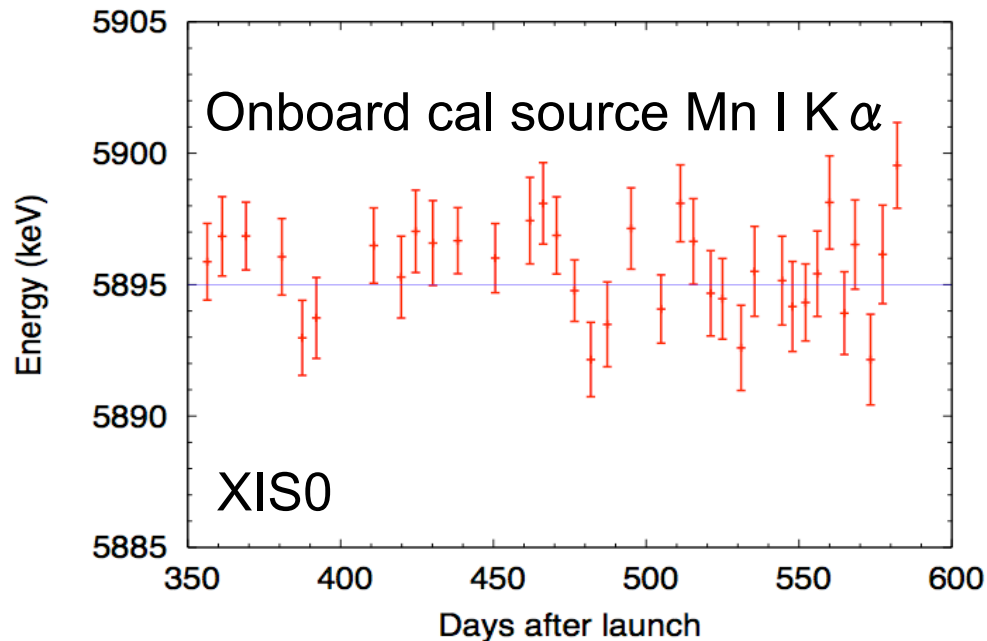
- The accuracy of energy scale after 2007 Feb. is being studied now.
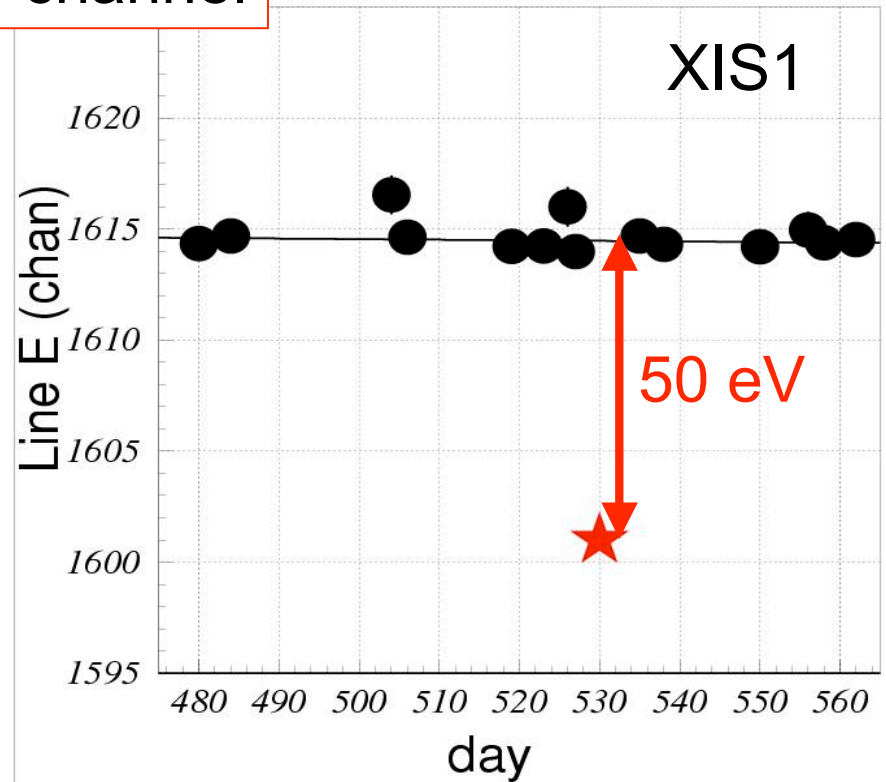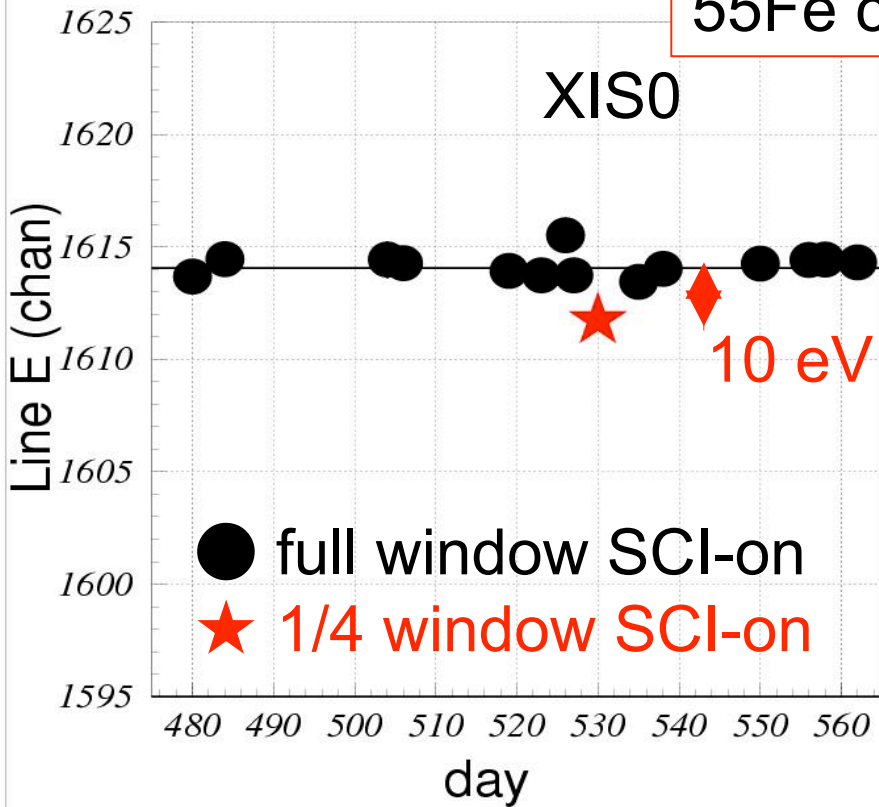
SCI-on RMF

RMF ~ (line spread function) X (quantum efficiency)

- Current RMF is the same as that for just after the launch.
- 55Fe line in Sep. 2006 suggests an additional width of 30eV (1sigma) for all sensors.
- Now the study is going on, and CALDB will be updated by Jan. 31.

SCI-on 1/4 window option gain

55Fe line of the SCI-on window option (1/4win) shows
lower gain: FI … 10 eV, BI … 50 eV

SCI-OFF Calibration

SCI-off summary

|		Gain (CTI, trail etc.)	RMF (line spread function x QE)

Normal /Burst	FI	•Obs until July, 2006
		  –OK
		•Obs after July, 2006
		  –Not good. CALDB will be upgraded by Jan. 31
			OK

	BI	•Obs until July, 2006
		  –Gain is slightly low
		•Obs after July, 2006
		  –Not good. CALDB will be upgraded by Jan. 31
			OK

1/4 window	FI	Gain is slightly low.	Same as for the normal mode.
	BI	Same as FI.	

2x2 data suggest lower gain than that of 5x5 or 3x3.

SCI-off Gain

- Checked with the calibration source (55Fe; 5.9keV)

- FI : inaccuracy ~5eV until 2006/07. Afterwards gradually increased in XIS3 and rapidly decreased in XIS0 and XIS2.

- BI: systematically higher in ~10eV until 2006/07.

  Afterwards gradually decrease.
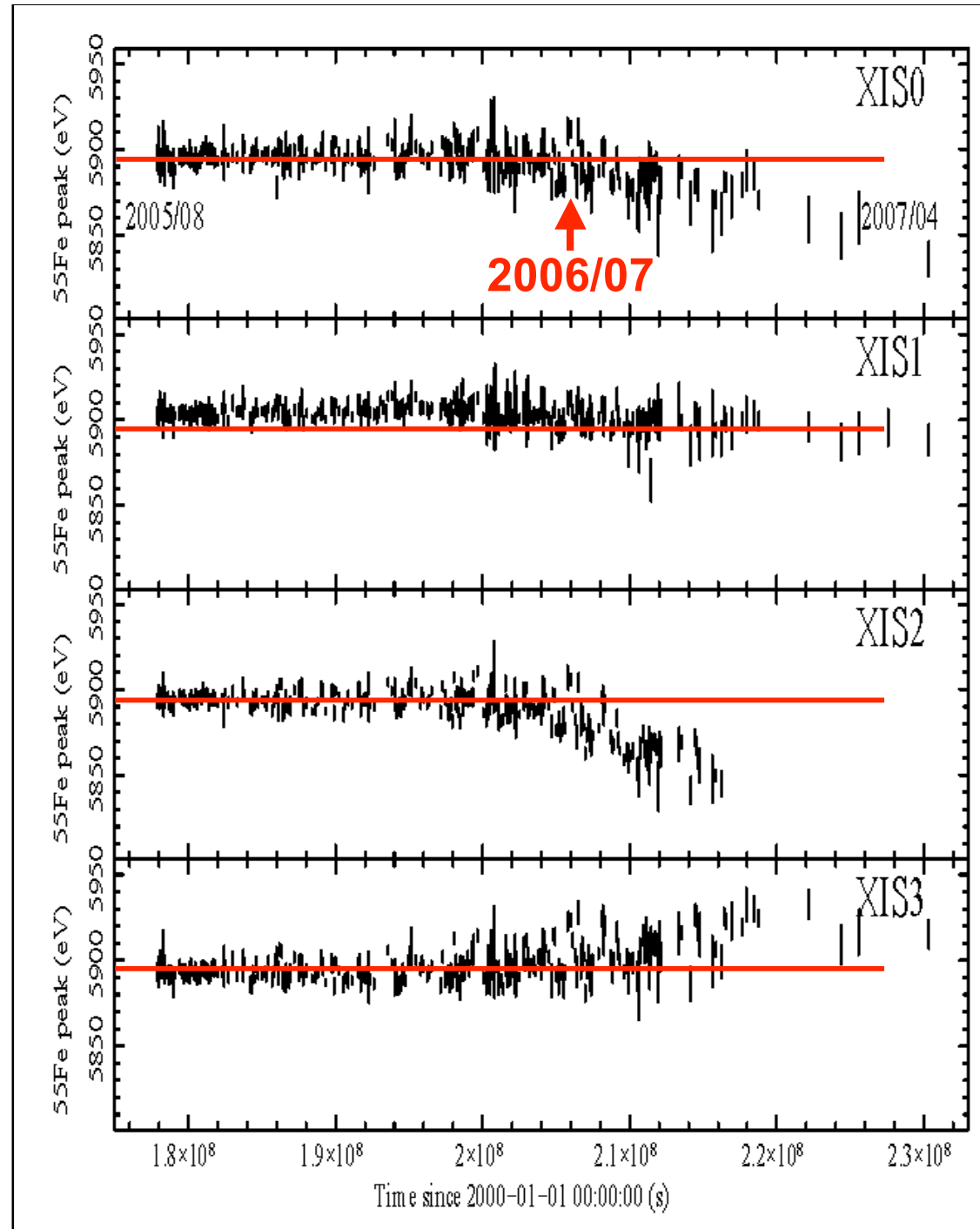
SCI-off Resolution

- Checked with 55Fe

- Less than 170eV (FWHM) untill July 2006 for all sensors.

- Increase after July 2006 and ~ 300eV in April 2007.
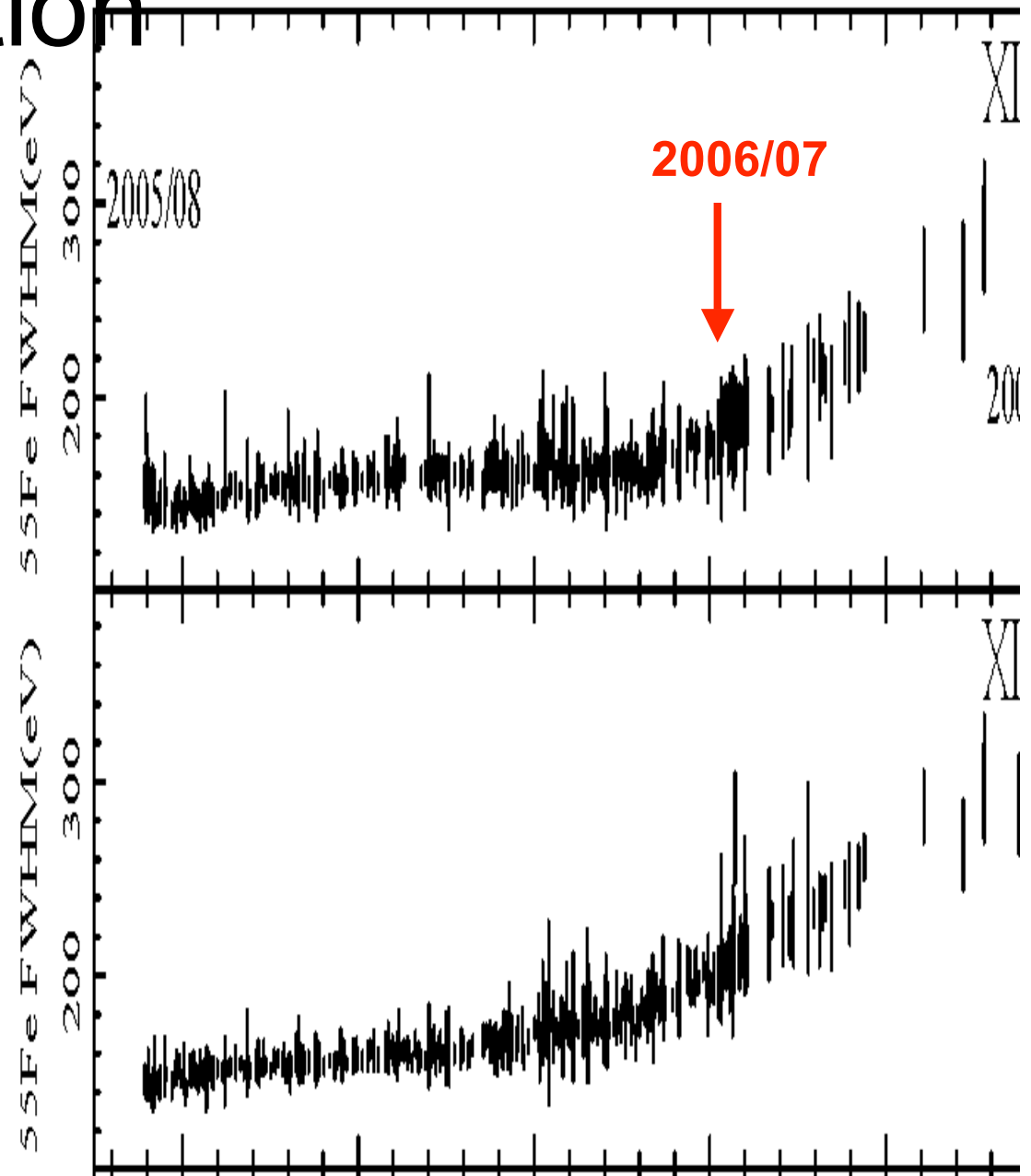
Status of SCI-off calibration

- Data observed until July 2006
  - Gain of BI is slightly high.
  - Gain of window option is low.
- Data observed after July 2006
  - Current calibrations are not good. This is because the CALDB values (CTI, gain etc.) are calculated by extrapolating previous trends.
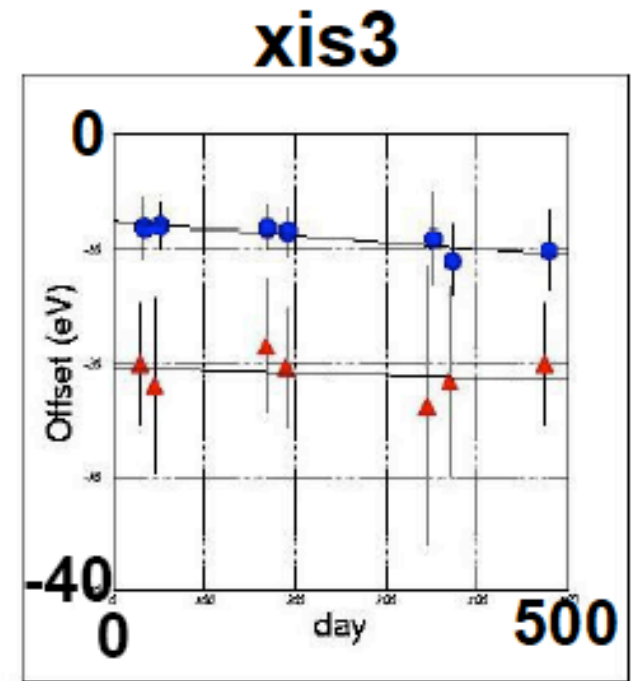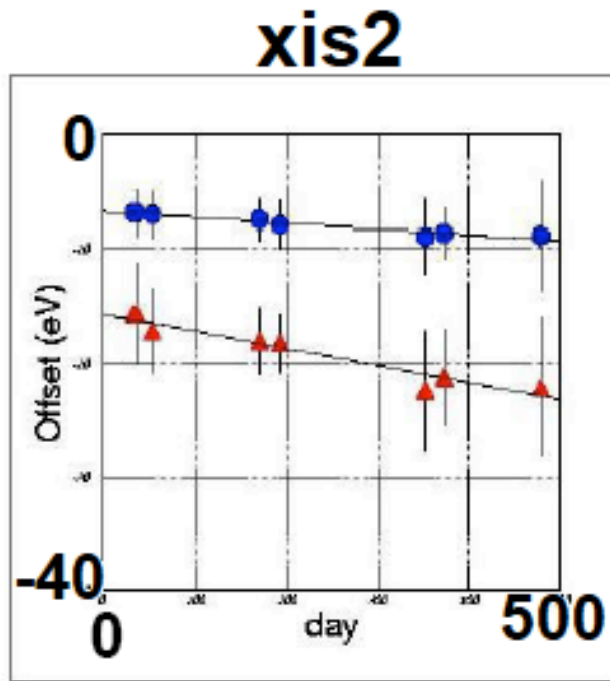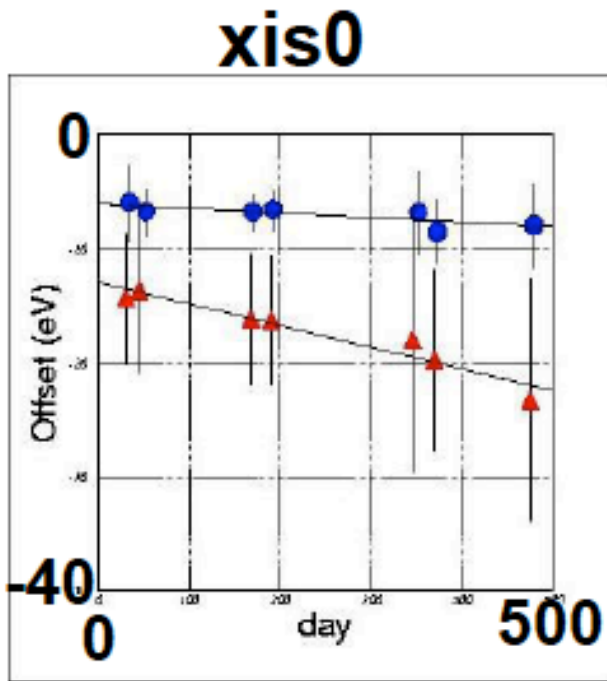 - CALDB will be upgraded by Jan. 31.

SCI-off 1/4 window gain

55Fe line of the SCI-off window option (1/4win) shows lower gain: FI … 70 eV, BI … 110 eV
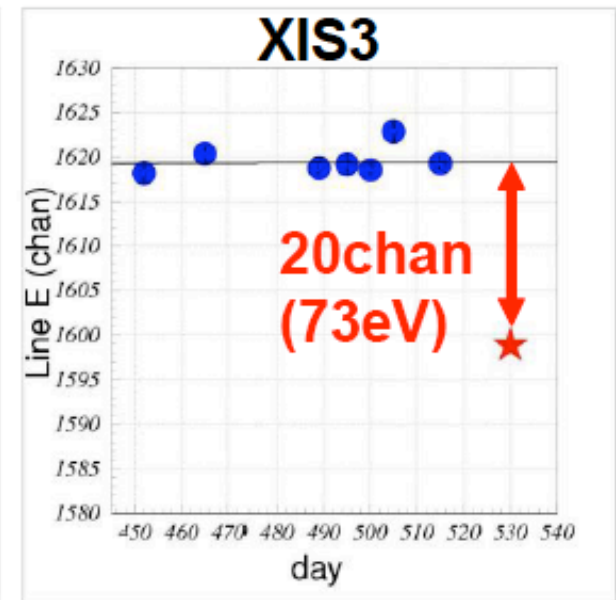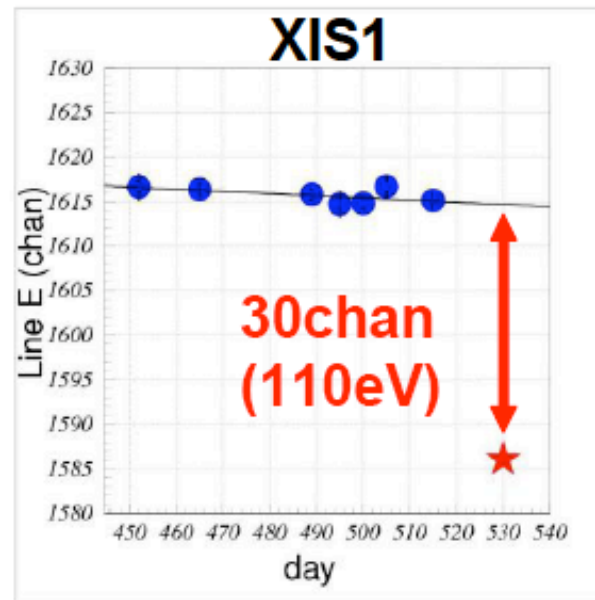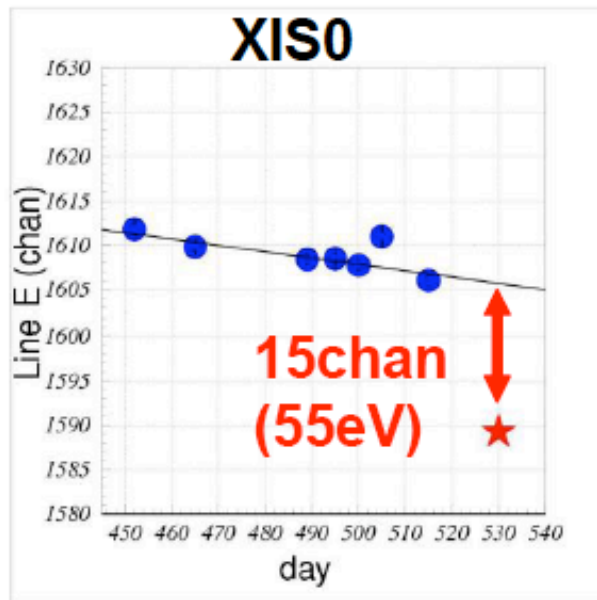
2x2 vs 5x5

● 5x5 – 2x2 @ 1keV
▲ 5x5 – 2x2 @ 5.9 keV

- Gain of the 2x2 data is lower.
- There is time evolution.

Since there are few data obtained with the 2x2 mode, the calibrations about 2x2 will be upgraded after completing the calibrations for the 3x3/5x5 mode.
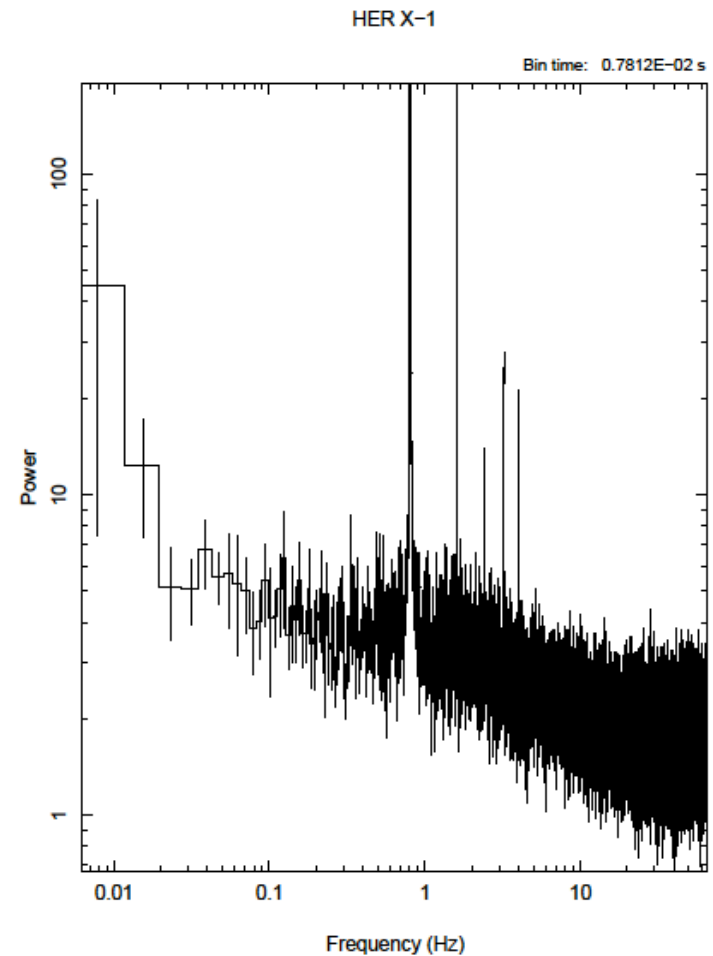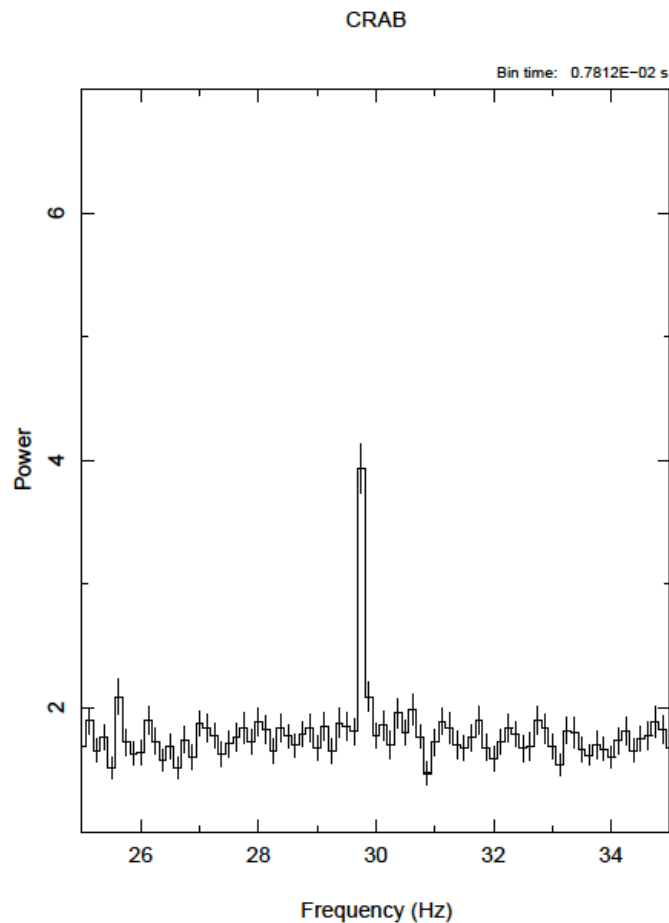
Timing

CALDB of the Timing mode

- Calibrations are still not good. The current CALDB values (gain, resolution etc.) for the timing mode are still those measured with ground experiments before the launch.
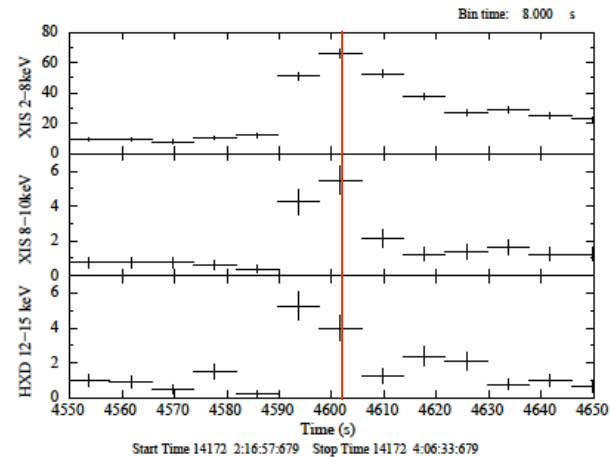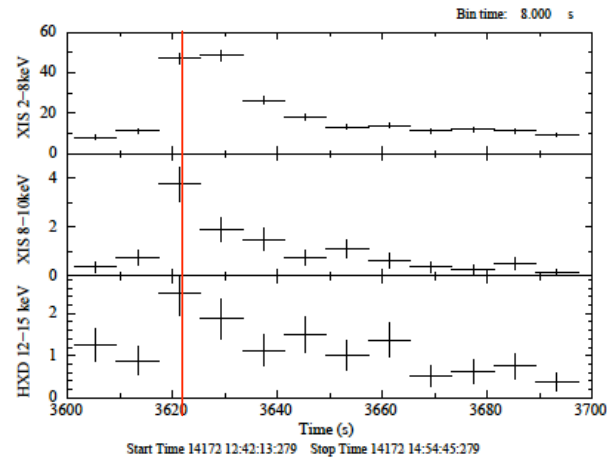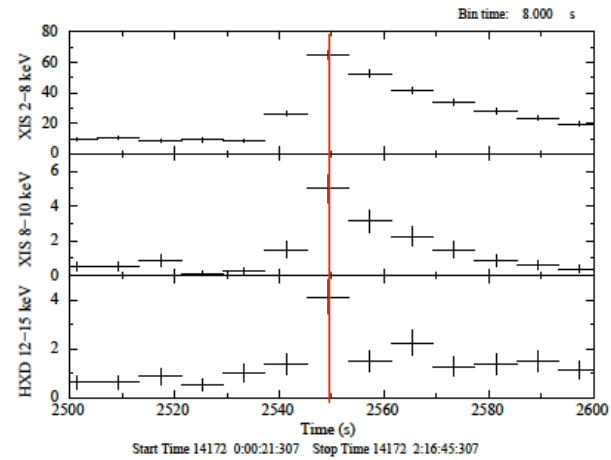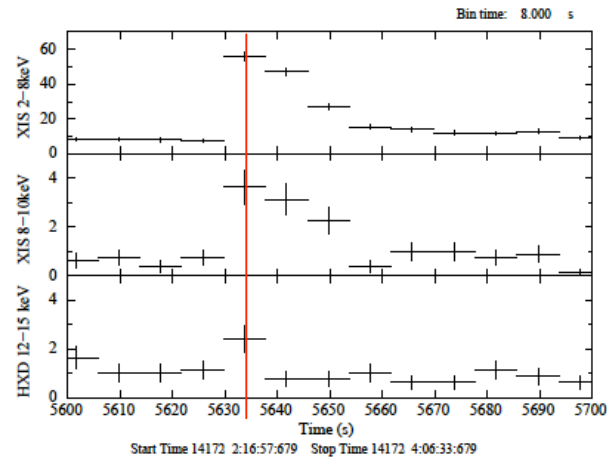
Timing of the Timing mode

Detect pulsation from Crab (29.7Hz) and Her X-1(0.81Hz).
No significant deviation from the HXD PIN.

Timing of the normal full window

4 bursts from A1742-294

No significant deviation from the HXD PIN.

Timing of the window mode

- Before ver 2.0
  - 1/4 win … T(HXD PIN) = T(XIS) + 6 sec
  - 1/8 win … T(HXD PIN) = T(XIS) + 7 sec
- From ver 2.0
  - The deviations are corrected.

XIS FTOOLS

- xiscontamicalc -- Calculate contaminant
- xiscoord -- Calculate coordinates
- xisexpmapgen -- Create a detector mask image and an exposure map
- xisgtigen - Write GTI for selecting data without saturation
- xispi -- Calculate PI and grade values from PHAS
- xisputpixelquality – Fill the STATUS column
- xisrmfgen -- Create the RMF
- xissimarfgen -- Calculate the ARF using the XRT ray-tracing simulator
- xissim -- Generate a simulated XIS event file using the outputs of mkphlist
  - mkphlist -- Photon list generator for xissim
- xistime – Calculate event time
- xisucode -- Assign the micro-code related keywords