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Title: Notes on Spaced-row charge injection (SCI) data in the ver 2.0 processing
Category: XIS
Author: Hironori Matsumoto (Kyoto U.)
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H.Matsumoto (Kyoto U.) and the XIS team

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1 Calibration

The current CALDB released on June 22, 2007, which is used in the ver 2.0 data processing, is based mainly on the iron K-lines from the Perseus cluster observed in September 2006 (OBSID=101012010) with the normal mode. This means that the time dependence of calibration parameters is not taken into account in the current CALDB. Furthermore, calibrations for the window options with the SCI have not been studied. Thus the parameters for the window options are the same as for the normal mode.
According to the MIT XIS team, the gain of the CCD with the SCI monitored with the ^{55}Fe calibration source has been changing with a rate of ∼20 eV (FI) and ∼50 eV (BI) per year. The degradation of the energy resolution (FWHM) is ∼10 eV (FI) and ∼20 eV (BI) per year. However, the time dependence cannot be corrected with the current CALDB.
At the time of September 2006, the charge transfer inefficiency (CTI) of CCDs with the SCI is almost zero. However, we were able to measure the small CTI of FI CCDs and to confirm that the pulse-height (PH) dependence of the CTI does not change whether the SCI is used or not. These results are reflected in the current CALDB. On the other hand, we were unable to obtain the CTI and its PH dependence of the BI CCD with enough reliability. Then the CTI of the BI CCD is set to be zero and the gain parameter is adjusted by using the center energy of the Mn-K$_\alpha$ line.
We confirmed that the center energy of the Mn-K$_\alpha$ line processed with the current CALDB is consistent with the canonical value (5.895 keV) within the uncertainty of ±5 eV at the time of September 2006. The line width of the Mn-K$_\alpha$ line of each sensor is consistent with the value just after the launch (i.e. ∼140-150 eV). On the other hand, the gain and energy resolution of each sensor in the lower energy band has not been studied well, even at the time of September 2005.

2 Software and analysis

Some charges spills out from the charge-injected (CI) rows to their neighboring rows. Therefore we should exclude the rows at both sides of the CI rows as well as the CI rows in the analysis of SCI data. This can be done by using the STATUS column of the event files. This removal results in the decrease of effective area. The decrease can be reflected in ARF files by using `xissimarfgen` and `xisexpmapgen`.

The software `xisrmfgen` can generate RMF files for the SCI data. Those RMF files are essentially the same as those for data obtained in August 2005, since the energy resolution of the SCI data at the time of September 2005 is consistent with the value just after the launch.