JX-ISAS-SUZAKU-MEMO 2006-16
Title: Limit of the XIS ver. 1 data in terms of the data processing
Category: XIS, Process
Author: H. Matsumoto
Date: 2006-09-29

Limit of the XIS ver. 1 data in terms of the data processing

Hironori Matsumoto (Kyoto Univ.) and the XIS team
E-mail: matumoto@cr.scphys.kyoto-u.ac.jp, xishelp@astro.isas.jaxa.jp

ver 0.0 by H. Matsumoto May 12, 2006
ver 0.1 by H. Matsumoto May 15, 2006
ver 0.2 by H. Matsumoto May 15, 2006

1 Introduction

This document describes the limit of the XIS data in terms of the data processing software for ver. 1.0, 1.1, 1.2.

2 Limitation of the XIS data

2x2 Mode

There is no way to do the charge trail correction for the 2x2 data in principle. This can cause an apparent decrease of the quantum efficiency, especially at a place on the CCD where the ACTY coordinate is large.

Window Option

The clocking pattern of the CCD used in the window option is much different from that of the full window observation. The CTI of the window option can be different from that of the full window option. However, the CTI correction for the window option is currently done with the same CTI parameters as those for the full window option.

Burst Mode

In the case of the burst mode, a dead time is introduced. However, since the current XIS softwares cannot handle it correctly, there is no information on the dead time in the current event files of the burst mode. The TIME and EXP_CENT_AETIME columns are also calculated assuming no dead time, and they systematically deviate from real values. For example, if you estimate a counting rate using a burst mode data with an exposure of 2s without any correction, the count rate is underestimated by a factor of 4, since the dead time is 6s. If you want to know the real value of the TIME and EXP_CENT_AETIME columns, please add 3s to them.

P-sum mode

Currently no P-sum mode is supported in ver. 1.

Table 1 summarized the limitation of XIS data.

Table 1: Summary of the limitation of XIS data in ver 1

		Clocking Mode				
		Normal		Burst		P-Sum
		Full Win.	Win. Opt.	Full Win.	Win. Opt.	
Edit Mode	5x5	◯	△(1)	△(2)	△(1)(2)	—
	3x3	◯	△(1)	△(2)	△(1)(2)	—
	2x2	△(3)	△(1)(3)	△(2)(3)	△(1)(2)(3)	—
	Timing	—	—	—	—	×

(1) Although the CTI parameters of the window option can be different from those of the full window mode, the CTI correction is made with the same parameters as those for the full window mode.
(2) The dead time of the burst option is not taken into account.
(3) The charge trail correction is not done for the 2x2 data.