

JX-ISAS-SUZAKU-MEMO-2006-30

Title: Description of the XIS calibration files for the v.1.2 data

Category: XIS, Process

Author: H. Matsumoto

Date: 2006-09-14

Description of the XIS calibration files for the v.1.2 data

Hironori Matsumoto (Kyoto Univ.) and the XIS team

e-mail:matumoto@cr.scphys.kyoto-u.ac.jp, xishelp@asro.isas.ac.jp

Sep 14, 2006

1 Introduction

This document describes the XIS calibration files released in July 2006, which are used in the v.1.2 pipe-line processing and also in Guest Observers' analysis of the v.1.2 data.

Description of the calibration files released previously is found at

<http://www.astro.isas.jaxa.jp/suzaku/caldb/doc>

or

<http://suzaku.gsfc.nasa.gov/docs/heasarc/caldb/suzaku/docs>

2 Microcode list file

2.1 File

`ae_xis_ucodelst_20060913.fits`

2.2 Previous Files

The one included in the previous public release of CALDB is

`ae_xis_ucodelst_20060524.fits`.

This file has been updated whenever new XIS microcodes are used in the operation. The previous version of the file is

`ae_xis_ucodelst_20060825.fits`.

2.3 Reason of Update

Latest microcodes are included for Periodic Charge Injection. In addition, the keyword CCNM0001 was changed from 'u-code list' to 'UCODE_LIST', so that the file is correctly taken via the calibration index file.

3 Contamination file

3.1 Files

`ae_xi0_contami_20060525.fits`

`ae_xi1_contami_20060525.fits`

`ae_xi2_contami_20060525.fits`

`ae_xi3_contami_20060525.fits`

3.2 Description

These files are released for the first time, and describe the amount, and spatial and time variation of the XIS contamination. These files are used in `xiscontamicalc` and `xissimarfgen` to calculate the amount of contamination and to create arf taking account of contamination, respectively.

4 Makepi file

4.1 Files

ae_xi0_makepi_20060522.fits
ae_xi1_makepi_20060522.fits
ae_xi2_makepi_20060522.fits
ae_xi3_makepi_20060522.fits

4.2 Previous Files

ae_xi0_makepi_20060125.fits
ae_xi1_makepi_20060125.fits
ae_xi2_makepi_20060125.fits
ae_xi3_makepi_20060125.fits

4.3 Reason of update

Improvement of calibration, in particular secular change of the PHA to PI conversion coefficients are taken into account.

5 RMF files

5.1 Files

ae_xi0_20060213.rmf
ae_xi1_20060213.rmf
ae_xi2_20060213.rmf
ae_xi3_20060213.rmf

5.2 Previous Files

ae_xi0_20051102.rmf
ae_xi1_20051103.rmf
ae_xi2_20051102.rmf
ae_xi3_20051102.rmf

5.3 Reason of update

New calibration is incorporated, and the upper energy boundaries are changed from 12 keV to 16.0 keV. However, please note that this does not mean the rmfs are reliable up to 16 keV. Calibration above 10 keV is now in progress. As was the case of the previous version, the quantum detection efficiency and the line width parameters in the rmfs were determined based on the ground calibration for each sensor. Thus, the 3 Forward Illuminated (FI) rmfs (xis0, 2 and 3) are different with one another, although the differences are rather small. On the other hand, the parameters related to the line profile (eg. tail profile, escape peak) are the same for all the FI sensors.

Notes 1:

The Back Illuminated (BI) RMF, `ae_xi1_20051103.rmf` was originally released as `ae_xi1_20051103c.rmf` within the Suzaku team. Efficiency in the very low energy part is calculated using the design values of the CCD structure. Systematic error of the BI rmf may be large below the C-edge.

Notes 2:

Loss of the XIS low energy efficiency due to the contamination is not incorporated in these responses nor the following ARFs.

6 Nominal ARF files

6.1 Files

ae_xi0_xisnom2_20060615.arf, ae_xi0_hxdnom2_20060615.arf
ae_xi0_xisnom4_20060615.arf, ae_xi0_hxdnom4_20060615.arf
ae_xi0_xisnom6_20060615.arf, ae_xi0_hxdnom6_20060615.arf
ae_xi1_xisnom2_20060615.arf, ae_xi1_hxdnom2_20060615.arf
ae_xi1_xisnom4_20060615.arf, ae_xi1_hxdnom4_20060615.arf
ae_xi1_xisnom6_20060615.arf, ae_xi1_hxdnom6_20060615.arf
ae_xi2_xisnom2_20060615.arf, ae_xi2_hxdnom2_20060615.arf
ae_xi2_xisnom4_20060615.arf, ae_xi2_hxdnom4_20060615.arf
ae_xi2_xisnom6_20060615.arf, ae_xi2_hxdnom6_20060615.arf
ae_xi3_xisnom2_20060615.arf, ae_xi3_hxdnom2_20060615.arf
ae_xi3_xisnom4_20060615.arf, ae_xi3_hxdnom4_20060615.arf
ae_xi3_xisnom6_20060615.arf, ae_xi3_hxdnom6_20060615.arf

6.2 Previous Files

ae_xi0_onaxis_20051211.arf, ae_xi0_hxdnom_20051211.arf
ae_xi1_onaxis_20051211.arf, ae_xi1_hxdnom_20051211.arf
ae_xi2_onaxis_20051211.arf, ae_xi2_hxdnom_20051211.arf
ae_xi3_onaxis_20051211.arf, ae_xi3_hxdnom_20051211.arf

6.3 Reason of update

New calibration is incorporated, and the upper energy boundaries are changed from 12 keV to 16.0 keV. For XIS nominal position (“xisnim”), bore-sight directions are considered, so the new files are not for “on-axis”.

For each sensor and pointing position, three ARFs are made for the extraction radius of 2 mm (=83.33 pixel=1.4474 arcmin), 4 mm (=166.67 pixel=2.8950 arcmin) and 6 mm.(=250.00 pixel=4.3424 arcmin).