Description of the HXD calibration files, for the 2.x data

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1 Basic Calibration Files (BCF)

The files are up-to-date in Nov 20 2009. Note that these files are automatically used in the HEADAS suzaku ftools, if you set values as 'CALDB'.

1.1 Energy Scale File

- ae_hxd_pinlin_20060724.fits (PIN)
- ae_hxd_gsolin_20051209.fits (GSO)

These files are used in the tool, hxdpi.

1.2 Gain History Files

- ae_hxd_pinghf_20051125.fits (PIN)
- ae_hxd_gsoght_20090930.fits (GSO)

These files are used in the tool, hxdpi.

The old format file, ae_hxd_gsoghf_xxxxxxxx.fits, are not valid for products by ver 2.x pipe line processing.

The gain history table of GSO, ae_hxd_gsoght_xxxxxxxx.fits, will be updated monthly. The file covers the observations from launch to one or two month(s) before the release.

1.3 Grade Definition Files

- ae_hxd_pinthr_20090830.fits (PIN)
- ae_hxd_gsopsd_20071010.fits (GSO)

These files are used in the tool, hxdgrade. The file ae_hxd_pinthr_20090830.fits defines the setting of the lower threshold of PIN PI, which will be updated roughly half or one year. The HXD team defines the epochs as the high-voltage settings of PIN diodes and/or their noise level in lower energy range.

epoch 1) 2005.8.17 – 2006.5.13
PIN HV = 500V/500V/500V/500V
PIN thr= ae_hxd_pinthr_20060727.fits

epoch 2) 2006.5.13 – 2006.10.2
PIN HV = 400V/500V/500V/500V
PIN thr = ae_hxd_pinthr_20060727.fits

epoch 3) 2006.10.2 – 2007.7.28
PIN HV = 400V/400V/500V/500V
PIN thr = ae_hxd_pinthr_20070522.fits

epoch 4) 2007.7.28 – 2008.8.31
PIN HV = 400V/400V/500V/500V
PIN thr = ae_hxd_pinthr_20070822.fits

epoch 5) 2008.9.1 – 2009.9.30
PIN HV = 400V/400V/500V/500V
PIN thr = ae_hxd_pinthr_20080717.fits

epoch 6) 2009.10.1 – **
PIN HV = 400V/400V/500V/500V
PIN thr = ae_hxd_pinthr_20090830.fits

1.4 Angular Response Database

- ae_hxd_pinart_20070611.fits (PIN)
- ae_hxd_gsoart_20051126.fits (GSO)

These files are used in the tool, hxdarfgen.

2 Calibration Product Files (CPF)

The files are up-to-date in Nov 20 2009.

2.1 PIN Response files

Please use the PIN response files corresponds to the epoch of your observation, listed in section 1.3.

epoch 1) ae_hxd_pinXXXXe1_20070914.rsp
epoch 2) ae_hxd_pinXXXXe2_20070914.rsp
epoch 3) ae_hxd_pinXXXXe3_20070914.rsp
epoch 4) ae_hxd_pinXXXXe4_20070914.rsp
epoch 5) ae_hxd_pinXXXXe5_20080716.rsp
epoch 6) ae_hxd_pinXXXXe6_20090826.rsp

where the XXXX characters indicates the distribution of the incident X-ray source [1].

XXXX = xinom Point source at the XIS nominal position
XXXX = hxnom Point source at the HXD nominal position
XXXX = flat Uniform emission from the region of 2 deg x 2 deg

2.2 GSO Response files

The latest GSO response files are

- ae_hxd_gsoXXXX_20080129.rsp,

where the XXXX represents the same meaning as in section 2.1.

XXXX = xinom Point source at the XIS nominal position
XXXX = hxnom Point source at the HXD nominal position

Note that the empirical correction factor to the Crab spectra are tentatively released as ARF file format from the following URL.
`http://www.astro.isas.jaxa.jp/suzaku/analysis/hxd/gsoarf/`

[1] Note that the use case of the flat response is described in the following URL. `http://heasarc.gsfc.nasa.gov/docs/suzaku/analysis/pin_cxb.html`