Hitomi Archive guide

Version 1.01

DATE Aug 2022

ISAS/ GSFC
Greenbelt, Maryland

Prepared by: Lorella Angelini

Table of Contents

.

CHANGE RECORD PAGE (1 of 2)

DOCUMENT TITLE : Hitomi archive guide			
ISSUE	DATE	PAGES AFFECTED	DESCRIPTION
Version 1.0	Sep 2017	All	First version

.

1 Archive

1.1 Introduction

Hitomi (aka Astro-H) was equipped with four different instruments that together cover a wide energy range 0.3-600 keV. The Soft X-ray Spectrometer (SXS [2]), which pairs a lightweight Soft X-ray Telescope [3] (SXT) with an X-ray Calorimeter Spectrometer, provides non-dispersive spectroscopy with < 7 eV resolution in the 0.3-12 keV energy range with a field of view of about 3x3 sqarcmin. Three additional scientific instruments extend the energy bandpass of the observatory. The Soft X-ray Imager (SXI [4]) expands the field of view with a new generation CCD camera in the energy range of 0.5-12 keV at the focus of the second lightweight SXT [3]; the Hard X-ray Imager (HXI [5.6], two units) performs sensitive imaging spectroscopy in the 5-80 keV band; the non-imaging Soft Gamma-ray Detector (SGD [7], two units) extends Hitomi's energy band to 600 keV. In addition there are three subsystems: two for the SXS, the Modulated X-ray Source (MXS [8] to calibrate the gain) and the anti-coincidence system; and one for the HXI, the Canadian Astro-H Metrology System (CAMS [9]) that tracks the movement of the Extended Optical Bench (EOB). Hitomi was launched on Feb 17 , 2016 at 5:45 pm JPS from Tanegashima Space Center . On March 27, 2016, JAXA lost contact with the satellite, and on April 28 announced that they would cease efforts to restore mission operations. The Hitomi instruments collected about one month's worth of data that have been processed and archived. The archive opened in Oct 2017.

The Hitomi archive contains all the information, data and software needed for the analysis of the Hitomi data. This document describes the contents and organization of the Hitomi archive and provides an overview of how the data archived have been generated.

1.2 Overview of the Hitomi archive

The Hitomi telemetry is collected in Japan where the 1st level of processing is executed. After that the data are transferred to the US for the second level of processing. The outputs of the second level of processing populate the data archive.

The 1st level of processing includes two steps. The telemetry data are stored first into a FITS file, the Raw Packet Telemetry (RPT), without un-packing the data. The RPT are created per observation where an observation includes the times requested by the PI on source and the times of the incoming slew. A sequence number, (also Observation ID) identifies uniquely an observing time period and may include an entire observation if shorter than a day. However observations longer than day are divided into different sequences each containing one day of data.
The content of an observation includes the science, HK data for all instruments and the general HK taken on sources as well as data taken from the incoming slew. The second step is unpacking the telemetry data, using the RPT, to create the First FITS Files (FFF). The FFFs include science and HK data for all data included in an observation. The FFF together with additional files that include, attitude, orbit, timing files and a file containing commands are delivered to the processing site in the US and constitute the input to the pipeline processing, second level of processing.
The first stage of pipeline processing is to apply calibration information without loss of the telemetered information to create the Second FITS File (SFF). The SFF are the Level 1 data, or unfiltered file. The

.

screening criteria are applied to the second stage of the pipeline to create the Level 2 data or cleaned events. The last step is to create, if appropriate, the Level 3 data or products, which are images spectra and light curves extracted from the cleaned event files. The pipeline also calculates quantities and creates files necessary for the event screening as well information that is used for the trend archive.
The software and calibration used in the pipeline processing is the same as in the Hitomi software package and the calibration information distributed to the science community via the HEASoft and CALDB respectively. All outputs of the pipeline are archived and organized in two main areas: the observation and trend. The archive also includes the calibration information in CALDB as well as all the software necessary to calibrate, screen and performed subsequent analysis of the Hitomi data in HEASoft.

1.3 Observation Data and Database

The Hitomi science data are organized in directories one for each sequence number. Each sequence includes science, housekeeping for all instruments (SXS, SXI, HXI, SGD) and subsystem (CAMS and MXS) on board of Hitomi as well as attitude, orbit and additional files created in the pipeline and used for screening the data. These data are organized in subdirectories and all these files are FITS files. The science data are divided in pointing and slew data and, may be further divided by the instrument mode or filter. Each sequence includes the Level 1, 2 and 3 of the science data corresponding to the unfiltered, cleaned and products files respectively. These files are the output of the pipeline processing. The FFF are not archived at the HEASARC however there is no loss of information between the FFF and SFF. The difference between FFF and SFF is that the FFFs have empty columns, which are filled by software during the processing to create the SFF (Level 1). These columns in the SFF can be recalculated if necessary with the Hitomi software distributed in HEASoft. Each sequence also includes GIF plots to preview the FITS products, HTML files which record the processing history and ASCII files for the region selection.

The pipeline also generates a database table recording high level information for each of the sequences At the archive site this table is ingested in the database system to allow users to select the data via a database browser.

1.4 Trend Data

The Hitomi trend data consist of files that are either a subset of the housekeeping data of the instruments or associated with the spacecraft or calculated using the science data during the processing. These data are mainly useful to monitor the instruments or specific housekeeping or to create high level calibration products. Data taken by the instruments during the slews are also archived in the trend area.
The trend files are organized in directories, each dedicated to a specific trend type. Generally not all the trend files are included within the associated sequence because either they are not necessary to the science analysis or because they are generated to monitor instrument performance. All the trend data files are in FITS format.

1.5 Software and Calibration Data

The software and calibration used in the pipeline processing or in the post processing are also archived and distributed with the HEASARC HEASoft (**http://heasarc.gsfc.nasa.gov/docs/software/lheasoft/**) and CALDB (**http://heasarc.gsfc.nasa.gov/docs/heasarc/caldb/caldb_intro.html**).
The Hitomi software package includes mission-specific tasks, as well as multi-mission tasks. The Hitomi-specific tasks consist of 78 tools to support various stages of the instrument calibration and their subsystems, data filtering, as well as simulation for all instruments. Each task is built as an FTOOL (this is the standard within HEASoft) and uses a standard parameter file as interface, the CFITSIO library to access and write FITS files and a common makefile to build the code. Each of the Hitomi tasks is dedicated to a specific function and is written in C or C++ or in Perl.
The Hitomi software uses the HEASARC CALDB to access the Hitomi calibration information. The Hitomi calibration data are in FITS files and include all the pre-launch information as well as the post-launch updates. The calibration files are designed to accommodate dependencies either on time or specific mode or other parameters to allow software to retrieve the correct file via the CALDB metadata that lists these dependences.

2 Observation General

2.1 Sequence number definition

Each observation is identified by a sequence number. The sequence number has 9 digits in the form of

CAAxxxyyz

The meaning for each of the digits is the following:

— C is the category code defined as:
  0 for non-pointing data (used in the initial phase, check out phase)
  1 for calibration observations
  4 for Galactic Compact sources (stars, CVs, X-ray binaries, and isolated neutron stars)
  5 for Galactic Diffuse emission
  7 for Extragalactic Compact object
  8 for Extragalactic Diffuse objects
  9 for Gamma-ray Bursts and other non-proposed TOOs
  Note : proposed TOOs do not have C=9 but rather should have the numbers corresponding to appropriate scientific categories (C=4 or C=7 are likely).

— AA : are two digits to identify the AO. 00 is for non-AO (e.g., SWG, DTT, calibration), 01 for A01 02 for AO2 etc.
— xxx: is a unique target number for a given C and AA. Multiple targets within the same proposal will have different target numbers. The start value is 001.
— yy: distigiush multiple pointing number (either specified by the proposal or due to operational needs). The start value is 01.
— z is a reserved digit used for special cases.

Note : If within an observation the on board computer, SMU, automatically changes from unit A to unit B or viceversa, on ground the data are separated into two observations with sequence numbers where the last digit is incremented by 1, where each observation has a unique SMU value. For example, if the original observation has assigned sequence number 101100000 and the SMU is set to A but during the observation the SMU is switched to B, on ground the two observations are tagged with 101100000 for SMU A and 101100001 fro SMU B.

2.2 Keywords in the FITS file to ID an Observation

All files that enter the archive have a number of keywords that identify the observation, the processing version, software and calibration files used in the pipeline. The keywords are:

- OBS ID contains the sequence number and is stored as a string

.

- PROCVER containing the processing version specified as MM.XX.YYY.NNN, where MM, XX, YY, and NNN are digits whose values are set as follows:
    - MM.XX are assigned to the pipeline processing changes, MM major changes, XX small changes. This is a string.
    - YYY is the version of the Hitomi software compatible to a specific HEA release. Not all the releases are implemented in the pipeline therefore it is possible that the pipeline run a different software release compared to the current release.
    - NNN is the CALDB version used in the pipeline.

- SEQPNUM containing the number of times a sequence has been processed within a processing version. This is a numerical value with no leading zeros.

- DATE containing the file creation date using the standard FITS convention for dates. This is a string.

- DATE-OBS and DATE-END containing the UTC values of the start and stop of the observation. The date is provided using the standard FITS convention for dates. This is a string. The start and stop times for each sequence are defined as the time when the maneuver starts and the pointing observation stops (which is the next maneuver start) respectively.

- SOFTVER containing the version of the HEASoft and Hitomi specific software used during the processing. This is as string defined as follows:
  Hea_DDMMMYYYY_Vxxx_Hitomi_DDMMMYYYY_Vyyy

  where DD is the day, MMM is the first 3 characters of the month name, YYYY the year and xxx and yyy the version number as advertised in the software distribution .

- CALDBVER containing the version of the calibration index that gives the calibration file list used during the processing of a given observation. This is a string defined as follows:
  genYYYYMMDD_hxiYYYYMMDD_sgdYYYYMMDD_sxiYYYYMMDD_sxsYYYYMMDD
  where the YYYYMMDD referenced to the latest CALDB version for that instrument.

- TLM2FITS containing a string to identify the release version of the 'mkf1stfits' tool that translates the telemetry into the FFF. This is a string defined as follows:
  MMM.XXX.YYYYY.NNN
    - MMM.XXX are assigned to the pre-pipeline processing changes, MM major changes, XX small changes. This is a string.
    - YYYYY is the Hitomi software compatible to a specific HEA release. Not all the releases are implemented in the pre-pipeline.
    - NNN is the CALDB used in the pre-pipeline.

These keywords should be present in all extensions or primary header containing the data.

.

3 Archive structure

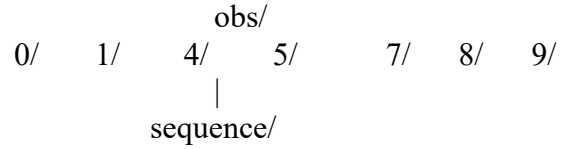
3.1 Data organization

The Hitomi data are organized in two main directories:

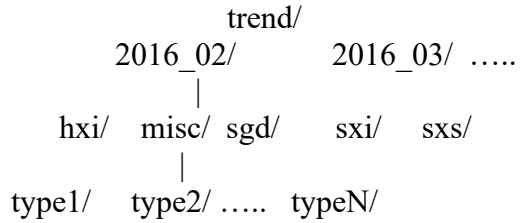
- **obs/:** contains the Hitomi science data. These data are organized by sequence number.

- **trend/:** contains instrument monitoring data. These data are organized by instrument first and, then by data type.

The **obs/** directory is divided into subdirectories named after the first digits of the sequence number. Sequences are placed under these subdirectories as shown below.



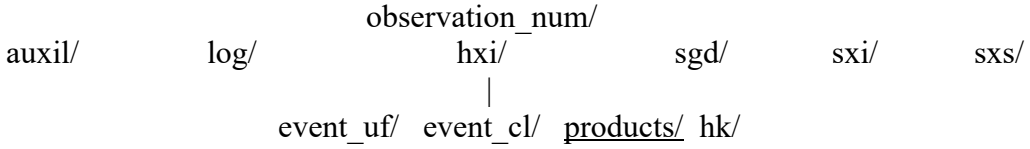
The **trend/** directory is divided into subdirectories of one month intervals named YYYY_NN, where YYYY is the year and NN defines the month within that year. Within each month the data divided by instrument and after by type where the actual files are located.



Besides these two main sections there is also a specific directory, nxb_20170510/, for the Non X-ray Background that contains files with non X-ray Background data to use in the data analysis.

3.2 The obs/ directory structure

Science data are located under the \obs directory. Each sequence is organized into a two level directory structure. The first level of directories divides the data by instrument and includes directories with common information for that sequence. The second layer of directories divides the data according to their level of processing. The directory structure is:



.

The content for the 1st layer of directories is the following:

- **/auxil**: contains files common to all instruments such as attitude and orbit as well as a catalog listing all the files present in the sequence.
- **/log**: contains html files reporting logs on the data processing.
- **/hxi** : contains all the science and HK files related to the HXI instruments. There are two HXI , HXI1 and HXI2 , as well as data from the aliment systems, CAMS1 and CAMS1. The data within are further sub-divided into directories related to the file types.
- **/sgd:** contains all the science and HK files related to the SGD instrument. The are two SGD , SGD1 and SGD2, and each is composed of three Compton cameras, CC1 , CC2 and CC3. The data within are further sub-divided into directories related to the file types.
- **/sxi** : contains all the science and HK files related to the SXI instruments. The data within are further sub-divided into directories related to the file types.
- **/sxs:** contains all the science and HK files related to the SXS instrument both the science and anti-coincidence data. This directory also contains data of the MSX subsystem. The data within are further sub-divided into directories related to the file types.

The content for the 2nd layer of directories is the following:

- **/event uf:** contains the unfiltered event files for all data modes, sensors and subsystems for that instrument. There are also present support files as GTI.
- **/event cl:** contains the science cleaned event files for hat instrument.
- **/hk:** contains housekeeping files related to the specific instrument.
- **/products:** contains all the high-level products derived from the science files. These are light curves and spectra on source, and images of the entire FOV. GIF files showing a plot of all instruments, if available, are stored only within the sxs/ product directory. The products directory is only presence in sequences starting with “1”.

.

4 Data Files

This section gives the filename convention and a brief description of the files included within an observation for the HXI , SGD , SXI, SXS as well as for the subsystems and the files common within a sequence. The different trend type are also listed.

4.1 Filename convention

There are three different conventions for the Hitomi filename depending if the file contains science, auxiliary or log data. The Hitomi FITS science files are named according to the following convention:

a) The filename for the science files (event) uses the following convention:

ahXXXXXXXXXiii_PRmmmmmmmm_ll.ext.gz

where

- ah : is the short for Astro-H
- XXXXXXXXX : is the observation identifier and it is identical to the directory name. This is identical to the sequence number or observation number.
- iii is the instrument specification. This string is set as follows:
  - 'cm1', 'cm2', 'cms' the CAMS1, CAMS2 or both CAMS respectively;
  - 'hx1', 'hx2', 'hxi' for the HXI1 and HXI2 or both HXI respectively;
  - 'sg1', 'sg2', 'sgd' for the SGD1 and SGD2 or both SGD respectively;
  - 'sxi' for the SXI;
  - 'sxs' for the SXS
  - 'gen' for files applicable to all instruments unless noted.

- P is to identify if the file contains data from pointing, slew or both periods. The code used is following:
  - s= slew
  - p= pointing
  - a=all data
- R is a sequential number used to separate data of the same kind if they are in excess of 2 GB uncompressed. If larger than 2 GB, the data are separated in different files and the value of R ranges from 1 to 9. If the data do not need to be separated R=0.

- mmmmmmmm is the file identifier. This string can contain up to 8 characters and allows to specify diversities between files from the same instrument. The string does not contain underscored or mathematical symbols.
- ll : is the file level. This is two character string for FITS and GIF files considering the products listed above

.

- ext : is the file extension.

The filename for the gti associated to an instrument uses the following convention:
ahXXXXXXXXXiii_xxx.gti.gz
where xxx is a prefix to identify the type of gti and iii is the instrument.

b) The filename for the auxiliary files are not instrument dependent but may depend on the pointing and the convention is the following :

- File that depends on the pointing:
  ahXXXXXXXXX_*PR*.ext.gz
  where *P* and *R* have the same meaning of the event data.

- File that do not depend on the pointing:
  ahXXXXXXXXX.ext.gz
- GTI that do not depends on instrument:
  ahXXXXXXXXX_yyy.gti.gz
  where xxx is a prefix to identify the type.

c) The filename for the log files uses the following convention:
ahXXXXXXXXX_nnnnnnnnn.ext.gz
where nnnnnnnnn is the file identifier.

4.2 Data content within an observation

This section lists the science data files included within a sequence. The file listing is given below, broken down by directory, together with the specific filenames. Within this description the [obs-id] is the 9 digit number XXXXXXXXX.

NOTE: Not all files may be present within a sequence (in particular in the /products directory) because these observations were taken at early stage of the mission where not all detectors were on and working nominally or limited by operational constrain.

— **auxil/ directory**

auxil directory content	
Filename	**Description**
ah[0-9].att	File containing the attitude information. If the observation includes the slew both slew and pointing attitude are present
ah[0-9].orb	File containing the orbit information
ah[0-9].tim	File containing information on the time to when a packet has been sent and received
ah[0-9].mkf	Make filter file containing a subset of HK parameters from the individual instrument, the subsystems as well as from the spacecraft. This information is used to screen the data

.

ah[0-9].ehk	Extended HK file containing additional calculated parameters (as the SAA and others). This information is used to screen the data
ah[0-9].com	File containing the operation commands
ah[0-9].cat	File containing the list of files output of the processing that are included within the sequences in the archive
ah[0-9]_fff.cat	File containing the list of files output of the 1st stage processing to create the FFF
ah[0-9]gen_a0.hk	File containing a subset of the general housekeeping applicable to this sequence
ah[0-9]_gen.gti	File containing the different type of GTIs. These are : gti indicating the slew, the pointing, the slew+pointing, times to when the GPS is on and the times with good attitute information

— **log/ directory**

log directory content	
Filename	**Description**
ah[0-9]_errlog.html	File containing the errors that occur during the processing.
ah[0-9]_flinfo.html	File containing a list of all files used and created for the observation. Temporary files are not in distribution.
ah[0-9]_hdpage.html	File containing a basic description of the observation and links to other information pages.
ah[0-9]_index.html	File containing an index to the major processing steps that occur in the processing of the observation.
ah[0-9]_joblog.html	File containing the entire log of the processing
ah[0-9]_job.par	File containing the parameter file for the entire processing
ah[0-9]_lv1.par	File containing the parameter file for the main processing

— **hxi/ directory**

hxi directory content	
event_uf directory	
Filename	**Description**
ah[0-9]cm1_aR_uf.fits	File containing the science information of the CAMS 1.
ah[0-9]cm2_aR_uf.fits	File containing the science information of the CAMS 2.
ah[0-9]hx1_cms.fits	Calibrated CAMS science for the HXI1
ah[0-9]hx2_cms.fits	Calibrated CAMS science for the HXI2
ah[0-9]hx1_cms.gti	Time of good CAMS intervals for the HXI1
ah[0-9]hx2_cms.gti	Time of good CAMS intervals for the HXI2
ah[0-9]hx1.att	Delta attitude derived from the CAMS and reports the HXI1 small movements to respect the main satellite body
ah[0-9]hx2.att	Delta attitude derived from the CAMS and reports the HXI2 small movements to respect the main satellite body
ah[0-9]hxi_tel.gti	Times to exclude the telemetry saturation interval for the HXI1 and HXI2
ah[0-9]hx1_aRbst.fits	File containing the bursts detected with HXI1 if any

.

ah[0-9]hx2_aRbst.fits	File containing the bursts detected with HXI2 if any
ah[0-9]hx1_aRsclhst.fits	File containing the shield data of the HXI1
ah[0-9]hx2_aRsclhst.fits	File containing the shield data of the HXI2
ah[0-9]hx1_pRcam_uf.evt	File containing the telemetered science data for the HXI1. Each row contains all signals due to one interaction of the X-ray with the detector layers. Pointing data
ah[0-9]hx2_pRcam_uf.evt	Same as above for HXI2 . Pointing data
ah[0-9]hx1_sRcam_uf.evt	Same as above for HXI1. Slew data
ah[0-9]hx2_sRcam_uf.evt	Same as above for HXI2. Slew data
ah[0-9]hx1_pRcamrec_ufa.evt	File containing HXI1 events reconstructed using all signals generated by one interaction of the X-ray with the detector layers. Each row contains one event. Cleaned science and pseudo events are derived from this file. Pointing data
ah[0-9]hx2_pRcamrec_ufa.evt	Same as above for HXI2. Pointing data
ah[0-9]hx1_sRcamrec_ufa.evt	Same as above for HXI1. Slew data
ah[0-9]hx2_sRcamrec_ufa.evt	Same as above for HXI2. Slew data
ah[0-9]hx1_aRcamexp_ufa.evt	File containing HXI1 calibration source Am 241 information expanded. A Am241 event may generated more that one signal when interacting with the detector layer. This file contains one signal in each row.
ah[0-9]hx2_aRcamexp_ufa.evt	Same as above for HXI2
ah[0-9]hx1_aRcamfitam_ufa.evt	File containing HXI1 events reconstructed using all signals generated by one interaction of the Am241 emission with the detector layers. Each row contains one event.
ah[0-9]hx2_aRcamfitam_ufa.evt	Same as above for HXI2
* R is a sequential number used to separate data of the same kind if they are in excess of 2 GB uncompressed. If larger than 2 GB, the data are separated in different files and the value of R ranges from 1 to 9. If the data do not need to be separated R=0. ** Slew data appears only in the 1st observation of the source	
event_cl directory	
Filename	**Description**
ah[09]hx1_pRcamrec_cl.evt	HXI1 Clean science event file screened for unwanted times and event status
ah[09]hx2_pRcamrec_cl.evt	Same as above Clean event for HXI2
ah[09]hx1_pRcamrecpse_cl.evt	HXI1 Pseudo event file screened for unwanted times and event status. These data are used to determine deadtime
ah[09]hx2_pRcamrecpse_cl.evt	Same Psuedo event for HXI2
hk directory	
Filename	**Description**
ah[0-9]hx1_aR.hk	File containing the Housekeeping of the HXI1
ah[0-9]hx2_aR.hk	File containing the Housekeeping of the HXI2
products directory	
Filename	**Description**
ah[0-9]hx1.img	HXI1 Sky Image with the full field of view
ah[0-9]hx2.img	HXI2 Sky Image with the full field of view
ah[0-9]hx1_src.lc	HXI1 Source Light curve from the region file within this directory
ah[0-9]hx2_src.lc	HXI2 Source Light curve from the region file within this directory

.

ah[0-9]hx1_src.pi	HXI1 Source Spectrum from the region file within this directory
ah[0-9]hx2_src.pi	HXI2 Source Spectrum from the region file within this directory
ah[0-9]hx1.rsp	HXI1 response appropriate for the Source Spectrum
ah[0-9]hx2.rsp	HXI2 response appropriate for the Source Spectrum
ah[0-9]hx1_src_sky.reg	HXI1 region file in Sky coordinate used to extract lightcurve and spectrum (ascii file)
ah[0-9]hx2_src_sky.reg	HXI2 region file in Sky coordinate used to extract lightcurve and spectrum (ascii file)
ah[0-9]hx1_bkg.pi	HXI1 Background Spectrum from the region file within this directory
ah[0-9]hx2_bkg.pi	HXI2 Background Spectrum from the region file within this directory
ah[0-9]hx1_bkg_sky.reg	HXI1 Background region file in Sky coordinate used to extract spectrum (ascii file)
ah[0-9]hx2_bkg_sky.reg	HXI2 Background region file in Sky coordinate used to extract spectrum (ascii file)

— **sgd/ directory**

sgd directory content	
event_uf directory	
Filename	**Description**
ah[0-9]sgd_tel.gti	Times to exclude the telemetry saturation interval for all Compton Camera on SGD1 and SGD2
ah[0-9]sg1_aRbst.fits	File containing the bursts detected with SGD1 if any
ah[0-9]sg2_aRbst.fits	File containing the bursts detected with SGD2 if any
ah[0-9]sg1_aRsclhst.fits	File containing the shield data of the SGD1
ah[0-9]sg2_aRsclhst.fits	File containing the shield data of the SGD2
ah[0-9]sg1_pRcc1_uf.evt	File containing the telemetered science data for the SGD1 detector CC1. Each row contains all signals due to one interaction of the X-ray with the detector layers. Pointing data
ah[0-9]sg1_pRcc2_uf.evt	Same as above for SGD1 CC2. Pointing data
ah[0-9]sg1_pRcc3_uf.evt	Same as above for SGD1 CC3. Pointing data
ah[0-9]sg1_sRcc1_uf.evt	Same as above for SGD1 CC1. Slew data
ah[0-9]sg1_sRcc2_uf.evt	Same as above for SGD1 CC2. Slew data
ah[0-9]sg1_sRcc3_uf.evt	Same as above for SGD1 CC3. Slew data
ah[0-9]sg2_pRcc1_uf.evt	File containing the telemetered science data for the SGD2 detector CC1. Each row contains all signals due to one interaction of the X-ray with the detector layers. Pointing data
ah[0-9]sg2_pRcc2_uf.evt	Same as above for SGD2 CC2. Pointing data
ah[0-9]sg2_pRcc3_uf.evt	Same as above for SGD2 CC3. Pointing data
ah[0-9]sg2_sRcc1_uf.evt	Same as above for SGD2 CC1. Slew data
ah[0-9]sg2_sRcc2_uf.evt	Same as above for SGD2 CC2. Slew data
ah[0-9]sg2_sRcc3_uf.evt	Same as above for SGD2 CC3.Slew data
ah[0-9]sg1_pRcc1rec_ufa.evt	File containing SGD1 detector CC1 events reconstructed using all signals generated by one interaction of the X-ray with the detector layers. Each row contains one event. Cleaned science and pseudo events are derived from this file. Pointing data

.

ah[0-9]sg1_pRcc2rec_ufa.evt	Same as above for SGD1 CC2.Pointing data
ah[0-9]sg1_pRcc3rec_ufa.evt	Same as above for SGD1 CC3.Pointing data
ah[0-9]sg1_sRcc1rec_ufa.evt	Same as above for SGD1 CC1.Slew data
ah[0-9]sg1_sRcc2rec_ufa.evt	Same as above for SGD1 CC2.Slew data
ah[0-9]sg1_sRcc3rec_ufa.evt	Same as above for SGD1 CC3. Slew data
ah[0-9]sg2_pRcc1rec_ufa.evt	File containing SGD2 detector CC1 events reconstructed using all signals generated by one interaction of the X-ray with the detector layers. Each row contains one event. Cleaned science and pseudo events are derived from this file. Pointing data
ah[0-9]sg2_pRcc2rec_ufa.evt	Same as above for SGD2 CC2.Pointing data
ah[0-9]sg2_pRcc3rec_ufa.evt	Same as above for SGD2 CC3.Pointing data
ah[0-9]sg2_sRcc1rec_ufa.evt	Same as above for SGD2 CC1.Slew data
ah[0-9]sg2_sRcc2rec_ufa.evt	Same as above for SGD2 CC2.Slew data
ah[0-9]sg2_sRcc3rec_uf.evt	Same as above for SGD2 CC3.Slew data
ah[0-9]sg1_aRcc1exp_ufa.evt	The interaction of one X-ray with the detector may generate more than one signal. This expended file contains one signal in each row for the SGD1 CC1 .
ah[0-9]sg1_aRcc2exp_ufa.evt	Same as above for SGD1 CC2
ah[0-9]sg1_aRcc3exp_ufa.evt	Same as above for SGD1 CC3
ah[0-9]sg2_aRcc1exp_ufa.evt	Same as above for SGD2 CC1
ah[0-9]sg2_aRcc2exp_ufa.evt	Same as above for SGD2 CC2
ah[0-9]sg2_aRcc3exp_ufa.evt	Same as above for SGD2 CC3
* R is a sequential number used to separate data of the same kind if they are in excess of 2 GB uncompressed. If larger than 2 GB, the data are separated in different files and the value of R ranges from 1 to 9. If the data do not need to be separated R=0. ** Slew data appears only in the 1st observation of the source	
event_cl directory	
Filename	**Description**
ah[09]sg1_pRcc1rec_cl.evt	SGD1 detector CC1 Clean science event file screened for unwanted times and event status
ah[09]sg1_pRcc2rec_cl.evt	Same as above for SGD1 detector CC2
ah[09]sg1_pRcc3rec_cl.evt	Same as above for SGD1 detector CC3
ah[09]sg2_pRcc1rec_cl.evt	SGD2 detector CC1 Clean science event file screened for unwanted times and event status
ah[09]sg2_pRcc2rec_cl.evt	Same as above for SGD2 detector CC2
ah[09]sg2_pRcc3rec_cl.evt	Same as above for SGD2 detector CC3
ah[09]sg1_pRcc1recpse_cl.evt	SGD1 detector CC1 Pseudo event file screened for unwanted times and event status. These data are used to determine dead time
ah[09]sg1_pRcc2recpse_cl.evt	Same as above for SGD1 detector CC2
ah[09]sg1_pRcc3recpse_cl.evt	Same as above for SGD1 detector CC3
ah[09]sg2_pRcc1recpse_cl.evt	SGD2 detector CC1 Pseudo event file screened for unwanted times and event status. These data are used to determine dead time
ah[09]sg2_pRcc2recpse_cl.evt	Same as above for SGD2 detector CC2
ah[09]sg2_pRcc3recpse_cl.evt	Same as above for SGD2 detector CC3
hk directory	
Filename	**Description**
ah[0-9]sg1_aR.hk	File containing the Housekeeping of the SGD1

.

ah[0-9]sg2_aR.hk	File containing the Housekeeping of the SGD2
products directory	
Filename	**Description**
ah[0-9]sg1cc1_src.lc	SGD1 Source Light curve for the CC1 detector
ah[0-9]sg1cc2_src.lc	SGD1 Source Light curve for the CC2 detector
ah[0-9]sg1cc3_src.lc	SGD1 Source Light curve for the CC3 detector
ah[0-9]sg2cc1_src.lc	SGD2 Source Light curve for the CC1 detector
ah[0-9]sg2cc2_src.lc	SGD2 Source Light curve for the CC2 detector
ah[0-9]sg2cc3_src.lc	SGD2 Source Light curve for the CC3 detector
ah[0-9]sg1_src.pi	SGD1 Source Spectrum
ah[0-9]sg2_src.pi	SGD2 Source Spectrum for the CC2 detector
ah[0-9]sg1.rsp	SGD1 Response
ah[0-9]sg2.rsp	SGD2 Response

— **sxi/ directory**

sxi directory content	
event_uf directory	
Filename	**Description**
ah[0-9]sx1_tel.gti	Times to exclude the telemetry saturation interval
ah[0-9]sx1_seg.gti	Good Time Intervals for each of the eights segment included in the SXI detector.
ah[0-9]sx1_mode.gti	Good Time Intervals for each of the SXI mode setting used within an observation
ah[0-9]sx1_a0exp.fits	File containing the header of each frame telemetered
ah[0-9]sx1_pRyyyyyyyy.bimg	Image mask containing bad pixel
ah[0-9]sx1_aRyyyyyyyy.fpix	File containing the flickering pixels detected in the SXI
ah[0-9]sx1_aRyyyyyyyy.hpix	File containing the hot pixels detected in the SXI
ah[0-9]sx1_pRyyyyyyyy_uf.evt	File containing the SXI science events for a given mode. Pointing data
ah[0-9]sx1_sRyyyyyyyy_uf.evt	Same as above for slew data
* R is a sequential number used to separate data of the same kind if they are in excess of 2 GB uncompressed. If larger than 2 GB, the data are separated in different files and the value of R ranges from 1 to 9. If the data do not need to be separated R=0. ** Slew data appears only in the 1st observation of the source ***yyyyyyyy is the data class identifying a specific setting. The 1st digit has no meaning. 2nd digit DETNAM : 0=CCD 1=CCD12 2=CCD34 ; 3rd digit DATAMODE : 0 window (full window), 1=window2 (1/8 window) , 2= window1burst (full window + burst mode), 3= window2burst (1/8 window + burst mode) ; 4th-7th digits is a code indicated dataclass; 8th digit : 0 all window on, 1 for area discriminator on . if a0ffffffff is set for invalid sequence	
event_cl directory	
Filename	**Description**
ah[09]sxi_pRyyyyyyyy_cl.evt	SXI1 Clean science event file screened for unwanted times and event status
hk directory	

.

Filename	Description
ah[0-9]sxi_aR.hk	File containing the Housekeeping of the SXI
products directory	
Filename	**Description**
ah[0-9]sxi.img	SXI Sky Image with the full field of view
ah[0-9]sxi_src.lc	SXI Source Light curve from the source region file within this directory
ah[0-9]sxi_src.pi	SXI Source Spectrum from the source region file within this directory
ah[0-9]sxi.arf *	SXI ancillary response appropriate for the Source Spectrum
ah[0-9]sxi.rmf *	SXI response appropriate for the Source Spectrum
ah[0-9]sxi.rsp *	SXI full response appropriate for the Source Spectrum
ah[0-9]sxi_src_sky.reg	SXI region file in Sky coordinate used to extract lightcurve and spectrum (ascii file)
ah[0-9]sxi_bkg.pi	SXI Background Spectrum from the background region file within this directory
ah[0-9]sxi_src_sky.reg	SXI Background region file in Sky coordinate used to extract the background spectrum (ascii file)

(*) NOTE: The following sequences contain a rsp file instead of the combination of arf /rmf:
100040060, 100041020, 100042020, 100042040 100043020
The source in these sequences was not at the aim point (CCD2 also known as CCD_ID=1) but detected in more than one CCD. The process that generated these products calculated the arf and rmf for the appropriate CCD and sum into a single rsp file.

— **sxs/ directory**

sxs directory content	
event_uf directory	
Filename	**Description**
ah[0-9]sxs_tel.gti	Times to exclude the telemetry saturation interval
ahsxs_adr.gti	Time interval to exclude the ADR cycle operation. This file is valid for the entire mission
ah[0-9]sxs_el.gti	Time intervals when events are not detected (bad intervals) . One extension is for the science data a second extension is for the anti-coincidence events
ah[0-9]sxs_pxFXXX_exp.gti	File containing several gti for the SXS
ah[0-9]sxs_aRac_uf.evt	File containing the telemetered anti coincidence events
ah[0-9]sxs_aRpxcalXXX_uf.evt	File containing the SXS events from the calibration pixel
ah[0-9]sxs_XXX_pxcal.ghf	File containing the gain calculated from the cal pixels
ah[0-9]sxs_pRpxFXXX_uf.evt	File contains the science SXS event detected by the pixel array. Pointing data
ah[0-9]sxs_sRpx FXXX_uf.evt	Same as above for slew data
* R is a sequential number used to separate data of the same kind if they are in excess of 2 GB uncompressed. If larger than 2 GB, the data are separated in different files and the value of R ranges from 1 to 9. If the data do not need to be separated R=0. ** Slew data appears only in the 1st observation of the source	

.

*** FXXX: F is one digit to represent the filter and XXX is a code to identify specific combination of keywords/mode. F has the following values : 0=undef 1=open 2=Polyimide 3=ND25 4=Be 5=Fe55 1st X is for the mode values: 0=normal 1=midres 2nd X is for the SHPTEMPL keyword values: 0-9a-z (36 in total) 3rd X for the DEVPTHRE keyword values: 0-9a-z (36 in total) FXXX is set to ffff when the data file is invalid and the files is not be processed.	
event_cl directory	
Filename	**Description**
ah[0-9]sxs_pRFXXX_cl.evt	SXS Clean science event file screened for unwanted times and event status
hk directory	
Filename	**Description**
ah[0-9]sxs_aR.hk	File containing the Housekeeping of the SXS
products directory	
Filename	**Description**
ah[0-9]sxs.img	SXS Sky Image with the full field of view
ah[0-9]sxs_src.lc	SXS Source Light curve from the entire array
ah[0-9]sxs_src.pi	SXS Source Spectrum from the entire array
ah[0-9]sxs.rmf	SXS response appropriate for the observation
ah[0-9]sxs.arf	SXS ancillary response appropriate for the Source Spectrum
ah[0-9]sxs_src_det.reg	SXS region file in DET coordinate
ah[0-9]_img.gif	GIF image that includes the FOV view of the instruments that are turned on. The image therefore can contain the SXS only or SXS and SXI only or SXS SXI HXI1 or SXS SXI HXI1 and HXI2. Note that even if the detector is on not always the source is in the field of view of all detectors
ah[0-9]_pi.gif	GIF plot of the source spectrum from the detectors in which the source is imaged.

4.3 Data content in the trend archive

This section lists the trend data file. The file listing is given below, broken down by directory, together with the specific filenames. Within this description the [obs-id] is the 9 digit number XXXXXXXXX.

— **misc/ directory**

misc/ directory content	
slew/ directory	
Filename	**Description**
ah[0-9]sxs_s0pxFXXX_uf.evt	SXS science slew unfiltered data
ah[0-9]sxi_s0yyyyyyyy_uf.evt	SXI science slew unfiltered data
ah[0-9]hx1_s0cam_uf.evt	HXI1 science slew unfiltered data

.

ah[0-9]hx2_s0cam_uf.evt	Same as above for HXI2
ah[0-9]hx1_s0camrec_uf.evt	HXI1 science slew unfiltered data reconstructed
ah[0-9]hx2_s0camrec_uf.evt	Same as above for HXI2
ah[0-9]sg1_s0cc1_uf.evt	SGD1 CC1 science slew unfiltered data
ah[0-9]sg1_s0cc2_uf.evt	Same as above for SGD1 CC2
ah[0-9]sg1_s0cc3_uf.evt	Same as above for SGD1 CC3
ah[0-9]sg2_s0cc1_uf.evt	Same as above for SGD2 CC1
ah[0-9]sg2_s0cc2_uf.evt	Same as above for SGD2 CC2
ah[0-9]sg2_s0cc3_uf.evt	Same as above for SGD2 CC3
ah[0-9]sg1_s0cc1rec_uf.evt	SGD1 CC1 science slew unfiltered data reconstructed
ah[0-9]sg1_s0cc2rec_uf.evt	Same as above for SGD1 CC2
ah[0-9]sg1_s0cc3rec_uf.evt	Same as above for SGD1 CC3
ah[0-9]sg2_s0cc1rec_uf.evt	Same as above for SGD2 CC1
ah[0-9]sg2_s0cc2rec_uf.evt	Same as above for SGD2 CC2
ah[0-9]sg2_s0cc3rec_uf.evt	Same as above for SGD2 CC3
ah[0-9].cat	Catalog file
timfvt/ directory	
Filename	**Description**
ah[0-9].tim	File containing information on the time to when a packet has been sent and received
ah[0-9]_fvt.fits	File containing the relation frequency versus temperature
ehkmkf/ directory	
Filename	**Description**
ah[0-9].mkf	Make filter file containing a subset of HK parameters from the individual instrument, the subsystems as well as from the spacecraft. This information is used to screen the data
ah[0-9].ehk	Extended HK file containing additional calculated parameters (as the SAA and others). This information is used to screen the data
attorb/ directory	
Filename	**Description**
ah[0-9].att	File containing the attitude information. If the observation includes the slew both slew and pointing attitude are present
ah[0-9].orb	File containing the orbit information
ah[0-9]_gen.gti	File containing different type of GTIs. These are : gti indicating the slew, the pointing, the (slew+pointing), times when the GPS is on and the time of good attitute information
hk/ directory	
Filename	**Description**
ah[0-9]gen_a0.hk1	File containing the general HK data. This information is divided in two files to keep the size small. Part 1 hk1
ah[0-9]gen_a0.hk2	Same as above hk2
ah[0-9].com	Commanding
ah[0-9].cat	Catalog file

.

— **hxi/ directory**

hxi/ directory content	
am241/ directory	
Filename	**Description**
ah[0-9]hx1_aRcamrecam_cl.evt	File containing HXI1 events reconstructed using all signals generated by one interaction of the Am241 emission with the detector layers.Each row contains one event. This file is cleaned for gti and event status
ah[0-9]hx2_aRcamrecam_cl.evt	Same as above for the HXI1
ah[0-9]hx1_aRcamfitam_cl.evt	File containing HXI1 events reconstructed using all signals generated by one interaction of the Am241 emission with the detector layers. Each row contains one event. This file is cleaned for gti and event status and used to calculate the gain
ah[0-9]hx2_aRcamfitam_cl.evt	Same as above for HXI2
ah[0-9]hx1_aRcamexpam_cl.evt	File containing HXI1 calibration source Am 241 information expanded and cleaned for gti and event status. A Am241 event may generated more that one signal when interacting with the detector layer. This file contains one signal in each row
ah[0-9]hx2_aRcamexpam_cl.evt	Same as above for HXI2
ah[0-9]hx1_a0.ghf	File containing the HXI1 gain using the Am241
ah[0-9]hx2_a0.ghf	Same as above for HXI2
nxb/ directory	
Filename	**Description**
ah[0-9]hx1_aRnxb_uf.evt	File containing the telemetered HXI1 data selected for the Non X-ray background
ah[0-9]hx2_aRnxb_uf.evt	Same as above for the HXI2
ah[0-9]hx1_aRnxbrec_cl.evt	File containing the reconstructed HXI1 data selected for the Non X-ray background
ah[0-9]hx2_aRnxbrec_cl.evt	Same as above for the HXI2
ah[0-9]hx1_aRnxbrecpse_cl.evt	File containing the reconstructed HXI1 psuedo data selected for the Non X-ray background
ah[0-9]hx2_aRnxbrecpse_cl.evt	Same as above for the HXI2
hk/ directory	
Filename	**Description**
ah[0-9]hxi_tel.gti	Times to exclude the telemetry saturation interval
ah[0-9]hx1_a0.hk	HXI1 housekeeping
ah[0-9]hx2_a0.hk	Same as above for HXI2
shield/ directory	
Filename	**Description**
ah[0-9]hx1_aRbst.fits	File containing the bursts detected with HXI1 if any
ah[0-9]hx2_aRbst.fits	File containing the bursts detected with HXI2 if any
ah[0-9]hx1_aRsclhst.fits	File containing the shield data of the HXI1
ah[0-9]hx2_aRsclhst.fits	File containing the shield data of the HXI2
cams/ directory	

.

Filename	Description
ah[0-9]cm1_aR_uf.fits	File containing the science information of the CAMS 1.
ah[0-9]cm2_aR_uf.fits	File containing the science information of the CAMS 2.
ah[0-9]hx1_cms.fits	Calibrated CAMS science for the HXI1
ah[0-9]hx2_cms.fits	Calibrated CAMS science for the HXI2
ah[0-9]hx1_cms.gti	Time of good CAMS intervals for the HXI1
ah[0-9]hx2_cms.gti	Time of good CAMS intervals for the HXI2
ah[0-9]hx1.att	Delta attitude derived from the CAMS and reports the HXI1 small movements to respect the main satellite body
ah[0-9]hx2.att	Delta attitude derived from the CAMS and reports the HXI2 small movements to respect the main satellite body
ah[0-9]cms_a0.hk	HK of the CAMS

— **sgd / directory**

sgd/ directory content	
nxb/ directory	
Filename	**Description**
ah[09]sg1_pRnxb1_uf.evt	SGD1 detector CC1 unfiltered data selected for the Non X-ray Background
ah[09]sg1_pRnxb2_uf.evt	Same as above for SGD1 detector CC2
ah[09]sg1_pRnxb3_uf.evt	Same as above for SGD1 detector CC3
ah[09]sg2_pRnxb1_uf.evt	SGD1 detector CC1 unfiltered data selected for the Non X-ray Background
ah[09]sg2_pRnxb2_uf.evt	Same as above for SGD2 detector CC2
ah[09]sg2_pRnxb3_uf.evt	Same as above for SGD2 detector CC3
ah[09]sg1_pRnxb1rec_cl.evt	SGD1 detector CC1 reconstructed data selected for the Non X-ray Background and cleaned for gti and event status
ah[09]sg1_pRnxb2rec_cl.evt	Same as above for SGD1 detector CC2
ah[09]sg1_pRmxb3rec_cl.evt	Same as above for SGD1 detector CC3
ah[09]sg2_pRnxb1rec_cl.evt	SGD1 detector CC1 reconstructed data selected for the Non X-ray Background and cleaned for gti and event status
ah[09]sg2_pRnxb2rec_cl.evt	Same as above for SGD2 detector CC2
ah[09]sg2_pRnxb3rec_cl.evt	Same as above for SGD2 detector CC3
ah[09]sg1_pRnxb1recpse_cl.evt	SGD1 detector CC1 Clean pseudo event file selected for the Non X-ray Background
ah[09]sg1_pRnxb2recpse_cl.evt	Same as above for SGD1 detector CC2
ah[09]sg1_pRnxb3recpse_cl.evt	Same as above for SGD1 detector CC3
ah[09]sg2_pRnxb1recpse_cl.evt	SGD1 detector CC1 Clean pseudo event file selected for the Non X-ray Background
ah[09]sg2_pRnxb2recpse_cl.evt	Same as above for SGD2 detector CC2
ah[09]sg2_pRnxb3recpse_cl.evt	Same as above for SGD2 detector CC3
hk/ directory	
Filename	**Description**
ah[0-9]hxi_tel.gti	Times to exclude the telemetry saturation interval

.

ah[0-9]sg1_a0.hk	SGD1 housekeeping
ah[0-9]sg2_a0.hk	Same as above for SGD2
shield/ directory	
Filename	**Description**
ah[0-9]sg1_aRbst.fits	File containing the bursts detected with SGD1 if any
ah[0-9]sg2_aRbst.fits	File containing the bursts detected with SGD2 if any
ah[0-9]sg1_aRsclhst.fits	File containing the shield data of the SGD1
ah[0-9]sg2_aRsclhst.fits	File containing the shield data of the SGD2

— **sxi/ directory**

sxi/ directory content	
nxb/ directory	
Filename	**Description**
ah[0-9]sx1_aRyyyyyyyy_nxb.evt	File containing the SXI Non X-ray background
badpixel/ directory	
Filename	**Description**
ah[0-9]sx1_aRyyyyyyyy.fpix	File containing the flickering pixels detected in the SXI
ah[0-9]sx1_aRyyyyyyyy.hpix	File containing the hot pixels detected in the SXI
cal/ directory	
Filename	**Description**
ah[0-9]sx1_aRyyyyyyyy_fe.evt	File containing the SXI calibration source events
ah[0-9]sx1_aRyyyyyyyy_fe.ghf	File containing the gain calculated from the calibration source events
frame/ directory	
Filename	**Description**
ah[0-9]sx1_aRrframe.fits	File containing the SXI R frame data
ah[0-9]sx1_aRdframe.fits	File containing the SXI Dark frame data
day/ directory	
Filename	**Description**
ah[0-9]sx1_aRyyyyyyyy_de.evt	File containing the SXI day time data
hk/ directory	
Filename	**Description**
ah[0-9]sx1_tel.gti	Times to exclude the telemetry saturation interval
ah[0-9]sx1_seg.gti	Good Time Intervals for each of the eights segment included in the SXI detector.
ah[0-9]sx1_mode.gti	Good Time Interval for each of the SXI mode setting used within an observation
ah[0-9]sx1_a0exp.fits	File containing the header of each frame telemetered
ah[0-9]sx1_a0.hk	File containing the SXI housekeeping

.

— **sxs/directory**

sxs/ directory content	
nxb/ directory	
Filename	**Description**
ah[0-9]sxs_aRpxFXXX_nxb.evt	File containing the SXS Non X-ray background
ah[0-9]sxs_aRpxFXXX_ne.evt	File containing the SXS Non X-ray background with loose selection
pix12/ directory	
Filename	**Description**
ah[0-9]sxs_aRpxcalXXX_uf.evt	File containing the SXS calibration pixel event (pixel 12)
ah[0-9]sxs_aRpxcalFXXX.lc	File containing the light curve of pixel 12
ah[0-9]sxs_XXX_pxcal.ghf	Gain calculated using calibration the pixel (pixel 12)
antico/ directory	
Filename	**Description**
ah[0-9]sxs_aRacwf_uf.evt	File containing the SXS anti coincidence diagnostic wf mode unfiltered
ah[0-9]sxs_aRacnr_uf.evt	File containing the SXS anti coincidence diagnostic nr mode unfiltered
ah[0-9]sxs_aRac_uf.evt	File containing the SXS anti coincidence events unfiltered
ah[0-9]sxs_aRac.lc	File containing the SXS anti coincidence lightcurve using the unfiltered anti coincidence data
pxdiag/ directory	
Filename	**Description**
ah[0-9]sxs_aRpxwf_uf.evt	File containing the SXS pixel diagnostic wf mode unfiltered
ah[0-9]sxs_aRpxpr_uf.evt	File containing the SXS pixel diagnostic pr mode unfiltered
ah[0-9]sxs_aRpxnr_uf.evt	File containing the SXS pixel diagnostic nr mode unfiltered
ah[0-9]sxs_aRpxblXXX_uf.evt	File containing the SXS pixel baseline event unfiltered
ah[0-9]sxs_aRpx.lc	File containing the SXS lightcurve of all pixels using the science unfiltered
hk/ directory	
Filename	**Description**
ah[0-9]sxs_tel.gti	Time to exclude the telemetry saturation intervals
ah[0-9]sxs_el.gti	Time intervals when events are not detected (bad interval) . One extension is for the science data a second extension is for the anti-coincidence events
ah[0-9]sxs_a0.hk1	File containing the SXS housekeeping 1
ah[0-9]sxs_a0.hk2	File containing the SXS housekeeping 2

4.4 Non X-ray Background

.

The non X-ray Background data were derived using the files in the trend area for each individual observation. These files were merged appropriately by data mode and instrument setting and applied an additional screening where needed.

nxb_20170510	
nxb/ directory	
Filename	**Description**
ah_gen_nxbehk_20140101v002.fits	Contain the orbital parameters for the entire mission
ah_hxi_nxbmkf_20140101v002.fits	Contain the HXI instruments HK for the entire mission
ah_hx1_nxbsaa_20140101v001.gti.gz	Contain the SAA applied to the cleaned HXI1 events
ah_hx2_nxbsaa_20140101v001.gti.gz	Contain the SAA applied to the cleaned HXI2 events
ah_hx1_nxbevtuf_20140101v001.evt	Contain the merged HXI1 merged NXB events not filtered for event screening
ah_hx1_nxbpseuf_20140101v001.evt	Contain the merged HXI1 merged NXB pseudo events not filtered for event screening
ah_hx1_nxbevtcl_20140101v001.evt	Contain the merged HXI1 merged NXB events cleaned
ah_hx1_nxbpsecl_20140101v001.evt	Contain the merged HXI1 merged NXB pseudo events cleaned
ah_hx2_nxbevtuf_20140101v001.evt	Contain the merged HXI2 merged NXB events unfiltered
ah_hx2_nxbpseuf_20140101v001.evt	Contain the merged HXI2 merged NXB pseudo events unfiltered
ah_hx2_nxbevtcl_20140101v001.evt	Contain the merged HXI2 merged NXB events cleaned
ah_hx2_nxbpsecl_20140101v001.evt	Contain the merged HXI2 merged NXB pseudo events cleaned
ah_sxi_nxbhk_20140101v002.fits.gz	Contain a subset of the SXI HK for the entire mission
ah_sxi_nxb40uf_20140101v002.evt.gz	Contain the merged SXI NXB events not filtered for event screening with event threshold at 40
ah_sxi_nxb40cl_20140101v002.evt.gz	Contain the merged SXI NXB events cleaned with event threshold at 40
ah_sxi_nxb100uf_20140101v002.evt.gz	Contain the merged SXI NXB events not filtered for event screening with event threshold at 100
ah_sxi_nxb100cl_20140101v002.evt.gz	Contain the merged SXI NXB events cleaned with event threshold at 100
ah_sxs_nxbafmar4_20140101v001.evt.gz	Contain the merged SXS NXB events cleaned obtained with observation taken before March 4 2016
ah_sxs_nxbbfmar4_20140101v001.evt.gz	Contain the merged SXS NXB events cleaned obtained with observation taken after March 4 2016

5 All Hitomi observations

The tables lists the observations performed by Hitomi.
The columns in table 10.8.1 contains:

.

- Column 1 - Observation number or sequence number
- Column 2 - Name of the target. The celestial objects observed are : Perseus, N132D, IGR J16318-4848, RXJ1856.5-3754 , G21.5-0.9. Crab
- Column 3&4 - Start and stop time
- Column 5&6 - RA_NOM and DEC_NOM : average pointing position
- Column 7 - SXS Exposure calculated using unfiltered event GTIs merged with the good telemetry GTIs
- Columns 8 - Reports for each instrument two infos: if science data are available, y=yes, n=no sb=instrument in standby (only for HXI and SGD) ; if source in the FOV, y=yes, n=no, p=partially, d=different CCD (valid only for the SXI)

10.8.1 OBS_ID	Target	Start Ttime	Stop Time	RA_NOM	DEC_NOM	Exposure	sxs /sxi /hx1 /hx2 /sg1 /sg2 if data - if source in FOV
000002010	MNV_small	20160223035008	20160223053404	60.7315	21.7169	6053	y /n /n /n /n /n
000003010	MNV_middle	20160223053404	20160224021138	55.8972	41.2963	73431	y /n /n /n /n /n
100040010	Perseus_core	20160224021138	20160225021313	49.8741	41.4839	86008	y-y /n /n /n /n /n
100040020	Perseus_core_adjustment	20160225021313	20160227003330	49.9316	41.5194	166754	y-y /n /n /n /n /n
000004010	Sunangle_0_for_EOB_ext	20160227003330	20160228044000	70.7093	-1.5220	99913	y /n /n /n /n /n
000004021	Sunangle_0_for_EOB_ext	20160228044000	20160229040000	70.7143	-1.5294	84013	y /n /n /n /n /n
000004022	Sunangle_0_for_EOB_ext	20160229040000	20160301040000	70.7160	-1.5293	86391	y /n /n /n /n /n
000004023	Sunangle_0_for_EOB_ext	20160301040000	20160302040000	70.7160	-1.5293	86122	y /n /n /n /n /n
000004030	Sunangle_0_for_EOB_ext	20160302040000	20160303225413	70.7159	-1.5290	154407	y /n /n /n /n /n
000005010	CO_3deg	20160303225413	20160304003426	69.6359	1.2835	5719	y /n /n /n /n /n
000005020	CO_3deg	20160304003426	20160304004111	69.6460	1.2936	396	y /n /n /n /n /n
100040030	Perseus	20160304004111	20160305120000	49.9324	41.5201	125571	y-y /n /n /n /n /n
100040040	Perseus	20160305120000	20160306193643	49.9321	41.5199	113795	y-y /n /n /n /n /n
100040050	Perseus	20160306193643	20160306225557	49.9323	41.5215	11948	y-y /n /n /n /n /n
100040060	Perseus_adjustment	20160306225557	20160307193557	49.9510	41.5123	74340	y-y /y-y /n /n /n /n
000006010	CO_10	20160307193557	20160307211535	253.6697	-45.4029	2911	y /y /n /n /n /n
000006020	CO_11	20160307211535	20160308003853	73.6394	45.1999	9915	y /y /n /n /n /n
100041010	N132D	20160308003853	20160308211400	81.2458	-69.6462	72132	y-p /y-d /n /n /n /n
100041020	N132D	20160308211400	20160310193716	81.4704	-69.6145	161534	y-n /y-d /sb /n /n /n
100042010	IGR_J16318-4848	20160310193716	20160311212411	247.7103	-48.8318	91464	y-n /y-d /sb /n /n /n
100042020	IGR_J16318-4848	20160311212411	20160312193700	247.7104	-48.8321	79963	y-n /y-d /y-n /sb /n /n
100042030	IGR_J16318-4848	20160312193700	20160313175600	247.7011	-48.8317	80335	y-n /y-d /y-n /sb /n /n
100042040	IGR_J16318-4848	20160313175600	20160314162041	247.8273	-48.8272	80675	y-n /y-d /y-p /sb /n /n
000007010	None2	20160314162041	20160314180017	82.0462	-30.3917	4293	y /y /y /sb /n /n
000007020	None2	20160314180017	20160315175647	82.3544	-30.3701	86179	y /y /y /y /n /n
000008010	IRU-CO-N1	20160315175647	20160315193942	89.3335	16.0193	4945	y /y /y /y /n /n
000008020	IRU-CO-N2	20160315193942	20160315212122	274.1789	27.8154	3981	y /y /y /y /n /n
000008030	IRU-CO-N3	20160315212122	20160315230502	240.2541	-57.3206	4293	y /y /y /y /n /n
000008040	IRU-CO-N4	20160315230502	20160316143648	59.5978	57.0816	53693	y /y /y /y /n /n

.

000008050	IRU-CO-N5	20160316143648	20160316161628	173.4656	-81.2169	3671	y /y /y /y /n /n
000008060	IRU-CO-N6	20160316161628	20160316194025	258.4625	10.5115	10188	y /y /y /y /sb /n
100043010	RXJ1856.5-3754	20160316194025	20160317194000	284.1442	-37.9092	85232	y-y /y-y /y-y /y-y /sb /n
100043020	RXJ1856.5-3754	20160317194000	20160318162000	284.1454	-37.9093	73549	y-y /y-y /y-y /y-y /sb /n
100043030	RXJ1856.5-3754 * FE55	20160318162000	20160319143900	284.1453	-37.9094	80186	y-y /y-y /y-y /y-y /sb /n
100043040	RXJ1856.5-3754	20160319143900	20160319170026	284.1447	-37.9092	8437	y-y /y-y /y-y /y-y /sb /n
100050010	G21.5-0.9	20160319170026	20160320143855	278.3878	-10.5688	76687	y-y /y-y /y-y /y-y /sb /n
100050020	G21.5-0.9	20160320143855	20160321170000	278.3872	-10.5688	94860	y-y /y-y /y-y /y-y /y-y /n
100050030	G21.5-0.9	20160321170000	20160322170000	278.3877	-10.5687	86393	y-y /y-y /y-y /y-y /y-y /sb
100050040	G21.5-0.9	20160322170000	20160323133005	278.3872	-10.5686	73793	y-y /y-y /y-y /y-y /y-y /y-y
100043050	RXJ1856.5-3754	20160323133005	20160324112257	284.1448	-37.9095	77542	y-y /y-y /y-y /y-y /y-y /y-y
100043060	RXJ1856.5-3754	20160324112257	20160325112823	284.1449	-37.9095	86722	y-y /y-y /y-y /y-y /y-y /y-y
100044010	Crab	20160325112823	20160325180123	83.6334	22.0132	20662	y-y /y-y /y-y /y-y /y-y /y-y

Notes:

- The SXS is operating with the FE55 filter in the obs 100043030.
- The source N132D, obs 100041010, is only partially in the FOV of the SXS
- The source N132D, obs 100041020, is located in the CCD_ID= 0 SEGMENT=0 in SXI and outside of the SXS and HXI FOV
- The source IGR J16318-4848, obs 100042010-20-30, is located in the CCD_ID==0 SEGMENT==0 and CCD_ID==2 SEGMENT==2 in the SXI and outside of the SXS amd HXI FOV.
- The source IGR J16318-4848, obs 100042040, is located in the CCD_ID==0 SEGMENT==0 in the SXI and outside of the SXS FOV and partially in the HXI FOV.

The columns in table 10.8.2 contains:

- Column 1 - Observation number or sequence number
- Column 2 - Name of the target. The celestial objects observed are : Perseus, N132D, IGR J16318-4848, RXJ1856.5-3754 , G21.5-0.9. Crab
- Column 3&4 – SXS : if the SXS ADR cycle is on (Y) ; Code of the Derivate Pulse Threshold
- Column 5&6&7 – SXI: DATACLASS reconstructed on ground ; window mode ; Event threshold valid for all 8 segments and datamode. Report also the event threshould is different at the aim position (CCD_ID==1 SEGMENT==1)
- Column 8&9 - HXI : DATAMODE for the HXI1 and HXI2. When marked STANDBY no science data are collected
- Column 10&11 - HXI : DATAMODE for the HXI1 and HXI2. When marked STANDBY no science data are collected

OBS_ID	Target	SXS		SXI			HXI		SGD	
		ADR		DATA CLASS	DATAMODE	Event Threshold	HXI1 DATA MODE	HX2 DATA MODE	SGD1 DATA MODE	SGD2 DATA MODE
000002010	MNV_small	Y	A120A							
000003010	MNV_middle		A120A							

.

100040010	Perseus_core	Y	A120A							
100040020	Perseus_core_adjustment	Y	A120A							
000004010	Sunangle_0_for_EOB_ext	Y	A120A							
000004021	Sunangle_0_for_EOB_ext		A120A							
000004022	Sunangle_0_for_EOB_ext	Y	A120A							
000004023	Sunangle_0_for_EOB_ext	Y	A120A							
000004030	Sunangle_0_for_EOB_ext	Y	A75A							
000005010	CO_3deg		A75A							
000005020	CO_3deg		A75A							
100040030	Perseus	Y	A75A							
100040040	Perseus		A75A							
100040050	Perseus		A75A							
100040060	Perseus_adjustment	Y	A75A	10000360	WINDOW1	30				
000006010	CO_10		A75A	10000360	WINDOW1	30				
000006020	CO_11		A75A	10000360	WINDOW1	30				
100041010	N132D		A75A	10000360 100003f0	WINDOW1	30 100				
100041020	N132D	Y	A75A	100003f0	WINDOW1	100	STANDBY			
100042010	IGR_J16318-4848		A75A	100003f0	WINDOW1	100	STANDBY			
100042020	IGR_J16318-4848	Y	A75A	100003f0	WINDOW1	100	CAMERA_NORMAL1	STANDBY		
100042030	IGR_J16318-4848		A75A	100003f0	WINDOW1	100	CAMERA_NORMAL1	STANDBY		
100042040	IGR_J16318-4848	Y	A75A	100003f0	WINDOW1	100	CAMERA_NORMAL1	STANDBY		
000007010	None2		A75A	100003f0	WINDOW1	100	CAMERA_NORMAL1	STANDBY		
000007020	None2		A75A	100003f0 100003f1	WINDOW1	100 100	CAMERA_NORMAL1	CAMERA_NORMAL1		
000008010	IRU-CO-N1		A75A	100003f0	WINDOW1	100	CAMERA_NORMAL1	CAMERA_NORMAL1		
000008020	IRU-CO-N2		A75A	100003f0	WINDOW1	100	CAMERA_NORMAL1	CAMERA_NORMAL1		
000008030	IRU-CO-N3		A75A	100003f0	WINDOW1	100	CAMERA_NORMAL1	CAMERA_NORMAL1		
000008040	IRU-CO-N4	Y	A75A	100003f0	WINDOW1	100	CAMERA_NORMAL1	CAMERA_NORMAL1		
000008050	IRU-CO-N5		A75A	100003f0	WINDOW1	100	CAMERA_NORMAL1	CAMERA_NORMAL1		
000008060	IRU-CO-N6		A75A	100003f0 100003f1	WINDOW1	100 100	CAMERA_NORMAL1	CAMERA_NORMAL1		
100043010	RXJ1856.5-3754		A75A	10000430 10000431	WINDOW1	40 2000	CAMERA_NORMAL1	CAMERA_NORMAL1	STANDBY	
100043020	RXJ1856.5-3754	Y	A75A	10000430 10000431	WINDOW1	40 2000	CAMERA_NORMAL1	CAMERA_NORMAL1	STANDBY	
100043030	RXJ1856.5-3754 *FE55		A75A	100000b1 10000430 100004f0 100004f1	WINDOW1	30 40 100(aim:40) 2048	CAMERA_NORMAL1	CAMERA_NORMAL1	STANDBY	
100043040	RXJ1856.5-3754		A75A	100004f0 100004f1	WINDOW1	100(aim:40) 2048	CAMERA_NORMAL1	CAMERA_NORMAL1	STANDBY	

.

100050010	G21.5-0.9	Y	A75A	100000b1 100004b0 100004b1	WINDOW1	30 100 2048(aim:100)	CAMERA_ NORMAL1	CAMERA_ NORMAL1	STANDBY	
100050020	G21.5-0.9		A75A	100004b0 100004b1	WINDOW1	100 2048(aim:100)	CAMERA_ NORMAL1	CAMERA_ NORMAL1	CC_ NORMAL1	
100050030	G21.5-0.9	Y	A75A	100000b1 100004b0 100004b1	WINDOW1	30 100 2048(aim:100)	CAMERA_ NORMAL1	CAMERA_ NORMAL1	CC_ NORMAL1	STANDBY
100050040	G21.5-0.9		A75A	100000b1 100004b0 100004b1	WINDOW1	30 100 2048(aim:100)	CAMERA_ NORMAL1	CAMERA_ NORMAL1	CC_ NORMAL1	CC_ NORMAL1
100043050	RXJ1856.5- 3754	Y	A75A	100000b1 10000530 10000531	WINDOW1	30 100(aim:40) 2048 (aim :40)	CAMERA_ NORMAL1	CAMERA_ NORMAL1	CC_ NORMAL1	CC_ NORMAL1
100043060	RXJ1856.5- 3754		A75A	100000b0 100000b1 10000530 10000531 112004e0 120004e0	WINDOW1 WINDOW1 WINDOW1 WINDOW1 WINDOW1BURST2 WINDOW1	30 30 100(aim:40) 2014(aim:40) 100 100	CAMERA_ NORMAL2	CAMERA_ NORMAL2	CC_ NORMAL1	CC_ NORMAL1
100044010	Crab		A75A	100000b0 100000b1 112004e0 112004e1 120004e0 120004e1	WINDOW1 WINDOW1 WINDOW1BURST2 WINDOW1BURST2 WINDOW1 WINDOW1	30 30 100 2048(aim:100) 100 2048	CAMERA_ NORMAL2	CAMERA_ NORMAL2	CC_ NORMAL1	CC_ NORMAL1

.