ASTRO-H

INSTRUMENT CALIBRATION REPORT
SXI CONTAMINATION
ASTH-SXI-CALDB-CONTAMI

Version 0.1

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ISAS/ GSFC

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DOCUMENT TITLE : SXI Contamination			
ISSUE	DATE	PAGES AFFECTED	DESCRIPTION
Version 0.1	March 2016	All	First Release

1 Introduction

1.1 Purpose

This document describes how the contamination CALDB file for the Soft X-ray Imager (SXI) is prepared. The CALDB file structure is define in the ASTH-SCT-04 and available from the CALDB web page at http:// hitomi.gsfc.nasa.gov.

1.2 Scientific Impact

The contamination CALDB file contains information about any build-up of molecular contamination in the optical path of the SXI. Such contamination reduces the soft X-ray response of the instrument (below ~ 1 keV), and introduces absorption edges that depend on the chemical composition. The contamination can be spatially variable, so the effect must be measured in a number of subregions across the SXI field of view. At the start of the mission, the contamination is assumed to be zero.

2 Release CALDB 20160310

Filename	Valid date	Release date	CALDB Vrs	Comments
ah_sxi_contami_20140101v001.fits	2014-01-01	20160310	001	

2.1 Data Description & Results

The CALDB file contains column density and covering factor as a function of time and subregion for three different chemical components. Since the contamination is assumed to be zero at the beginning of the mission, a single time stamp is used, and for each chemical component the column density is populated with zeros and the covering factor is populated with ones. The CALDB file also contains (in a separate extension) the transmission curves for a column density of $1x10^{18}$ cm^{-2} of each component. In the current version, these components are assumed to be hydrogen; carbon (with a C K absorption edge at 0.28 keV); and oxygen (with an O K absorption edge at 0.53 keV). The transmission curves were generated from the XSPEC *varabs* model, assuming Verner et. al. (1996) photoelectric absorption cross-sections, and are reported in 5 eV bins. The curves are shown in Figure 1.

Each subregion is a 20x20 pixel square, so each of the four SXI CCDs contains 32x32 (or 1024 total) subregions, for a total of 4096 subregions over the SXI field of view.

2.2 Final remarks

This is the first release of this CALDB file. Depending on the accumulation of contaminant on the SXI contamination blocking filter (CBF) or CCDs, this file may be updated as the accumulation rate changes.

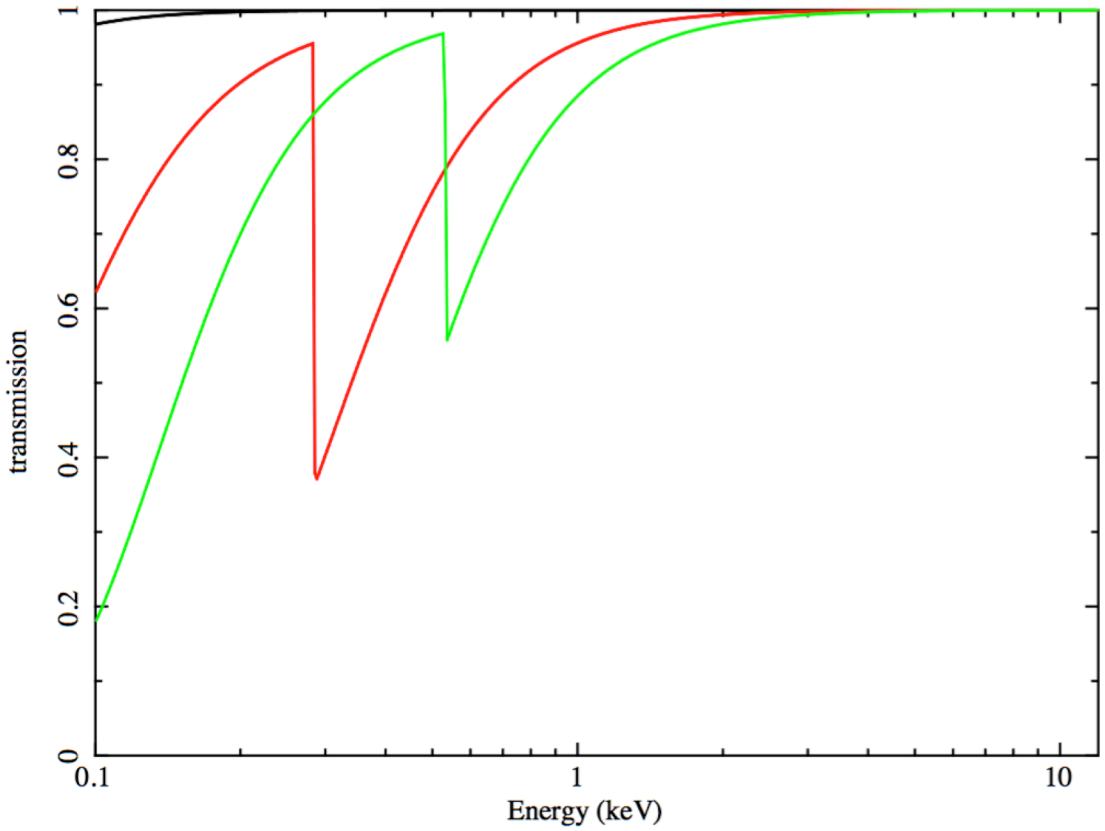

Figure 1. Transmission curves in the SXI contamination CALDB file. These are tabulated for a column density of 1×10^{18} cm^{-2} of hydrogen (black), carbon (red), and oxygen (green).