

SXI readme (updated on Aug 2024)

The Solar X-ray Imager (SXI) telescope observed the Sun in wavelengths ranging from soft X-rays to extreme ultraviolet (see the specific filters for each GOES satellite in the DATA NOTES section below). SXI collected an image once per minute and the exposure settings followed a sequence that was optimized to observe three primary phenomena as they are reflected in the Solar atmosphere: coronal structures, active regions, and solar flares. Each image was a 512 x 512 array with 5 arc sec pixels.

FITS files at <https://www.ncei.noaa.gov/data/goes-solar-xray-imager/access/fits>:

First data: 2003-01-22 (from GOES-12)

Last data: 2020-03-02 (from GOES-15)

PNG files at <https://www.ncei.noaa.gov/data/goes-solar-xray-imager/access/browse>:

First image: 2001-08-13 (from GOES-12)

Last image: 2020-03-02 (from GOES-15)

File Naming Convention: SXI_yyyymmdd_hhmmssfff_pv_nn.[FITS or PNG] (29 characters)

- 'yyymmdd_hhmmssfff' UTC date (DATE_OBS). 'fff' represents fraction of a second.
- 'p' data product code, i.e.,
 - p = 'A' => Level-0 (Unprocessed. Images are raw and uncalibrated)
 - p = 'B' => Level-1 (Processed. Images have been calibrated, rotated, etc.)The remainder of the alphabet is available for special processed Level-2 product codes.
- 'v' processing version code, i.e., Reprocessed data will be differentiated by incrementing the version code.
- 'nn' satellite ID (i.e., GOES-nn. SXI was an instrument available at GOES-12 to GOES-15)

Each FITS files daily directory also includes two INDEX files that contain a few useful keywords from each file in the directory, their filenames look like this: INDEX_yyyymmdd_p_nn.FITS

For a description of the SXI FITS header content, see the Level-0 and Level-1 keyword descriptions [here](#).

DATA NOTES

- **GOES-12 SXI Filters:**

[#, wavelength in angstroms, filter name, (Metadata entry)]

- 01, 6-65, Poly thin (P_THN_A)
- 02, UV, UV diffuser
- 03, 6-65, Poly thin (P_THN_B)
- 04, 6-60, Poly medium (P_MED_B)
- 05, 6-20, Be thin (B_THN_B)
- 06, 6-16, Be medium (B_MED)
- 07, 6-12, Be thick (B_THK)
- 08, 0-0, Radiation shield (RDSH)
- 09, 6-80, Open (OPEN)
- 10, 6-20, Be thin (B_THN_A)
- 11, 6-50, Poly thick (P_THK)
- 12, 6-60, Poly medium (P_MED_A)

- **GOES-NOP (-13, -14 and -15) SXI filters:**

Filter		Position		FW Hex		GOES-13	GOES-14/15	
FW1	FW2	FW1	FW2	FW1	FW2	WAVELNTH		COLOR
Open	Be50	1	1	1D	1D	BE50	BE50	blue
Open	Al12	1	2	1D	3B	AL12	AL12	blue
Open	Pi_3b	1	3	1D	59	PTHNb	PTHNb	green
Open	Open	1	4	1D	77	OPEN	OPEN	red
Open	Sn_2b/Ag	1	5	1D	95	TINb	SILVER	yellow
Open	Be12b	1	6	1D	B3	BE12b	BE12b	blue
Be12a	Be50	2	1	3B	1D	BE62	BE62	blue
Be12a	Al12	2	2	3B	3B	BE12AL	BE12AL	grey
Be12a	Pi_3b	2	3	3B	59	BE12P3	BE12P3	grey
Be12a	Open	2	4	3B	77	BE12a	BE12a	blue
Be12a	Sn_2b/Ag	2	5	3B	95	BE12SN	BE12AG	grey
Be12a	Be12b	2	6	3B	B3	BE25	BE25	blue
Sn_2a/TinMesh	Be50	3	1	59	1D	SNBE50	TMBE50	grey
Sn_2a/TinMesh	Al12	3	2	59	3B	SNAL	TMAL	grey
Sn_2a/TinMesh	Pi_3b	3	3	59	59	SNP3	TMP3	grey
Sn_2a/TinMesh	Open	3	4	59	77	TINa	TM	yellow
Sn_2a/TinMesh	Sn_2b/Ag	3	5	59	95	TIN2	TMAG	yellow
Sn_2a/TinMesh	Be12b	3	6	59	B3	SNBE12	TMBE12	grey
Glass	Be50	4	1	77	1D	GLBE50	GLBE50	grey
Glass	Al12	4	2	77	3B	GLAL	GLAL	grey
Glass	Pi_3b	4	3	77	59	GLPTHN	GLPTHN	grey
Glass	Open	4	4	77	77	GLASS	GLASS	red
Glass	Sn_2b/Ag	4	5	77	95	GLTIN	GLAG	grey
Glass	Be12b	4	6	77	B3	GLBE12	GLBE12	grey
Pi_3a	Be50	5	1	95	1D	P3BE50	P3BE50	grey
Pi_3a	Al12	5	2	95	3B	P3AL	P3AL	blue
Pi_3a	Pi_3b	5	3	95	59	PTHN2	PTHN2	green
Pi_3a	Open	5	4	95	77	PTHNa	PTHNa	green
Pi_3a	Sn_2b/Ag	5	5	95	95	P3SN	P3AG	grey
Pi_3a	Be12b	5	6	95	B3	P3BE12	P3BE12	grey
Pi_8	Be50	6	1	B3	1D	P8BE50	P8BE50	grey
Pi_8	Al12	6	2	B3	3B	P8AL	P8AL	grey
Pi_8	Pi_3b	6	3	B3	59	PTHK2	PTHK2	green
Pi_8	Open	6	4	B3	77	PTHK	PTHK	green
Pi_8	Sn_2b/Ag	6	5	B3	95	P8SN	P8AG	grey
Pi_8	Be12b	6	6	B3	B3	P8BE12	P8BE12	grey

- **GOES-12 coronal hole product announcement:** Beginning on Dec 15, 2004, NOAA/SWPC started routine production of a coronal hole image product. This product was created 4 times per day (01:00, 07:00, 13:00, and 19:00 UT), for the purpose of identifying coronal holes, and they became available at approximately 08:00, 14:00, 20:00, and 02:00 UT. Each coronal hole image was created from a sum of 12 hours of images (corrected for solar rotation), spanning the period 6 hours prior to the nominal coronal hole image time to 6 hours after. The coronal hole image is composited from 3-second integration, Level-1 (calibrated) images taken through the Thin Polyimide (PTHN) filter. The need to create this new product was driven by the loss of the ability to use the SXI Open Filter position and by anomalous high voltage power supply (HVPS) behavior. The inability to use the Open Filter was caused by the failure of at least 1 of the 6 entrance filters that normally shield the SXI optics from visible and ultraviolet light. The HVPS behavior has forced imaging to be conducted at a lower than desired gain.

- **GOES-12 image sequences (2001-2004):** The following summary lists the first image in each sequence change and provides a brief description of what was done in the sequence (eg., 3-filter patrol, UV-bulb test images, MCP-gain testing, etc.). This information was provided by Vic.Pizzo@noaa.gov