

GOES-16 SUVI Coronal Hole Boundaries Level 2 (L2) Data Release
May 24, 2024
Read-Me for Data Users

The GOES-16 Solar Ultraviolet Imager (SUVI) is NOAA's operational solar extreme-ultraviolet imager. The SUVI Level 2 Coronal Hole Boundary files in these directories are produced by NOAA's National Centers for Environmental Information in Boulder, Colorado. These data have been created from interpreting SUVI Level 2 Thematic Maps. Please note that these files are considered to be experimental and thus will be improved in future releases. Users requiring assistance with these files can contact the NCEI SUVI team by emailing goesr.suvi@noaa.gov.

An example python script illustrating how to use and display information from these files is available at https://cires-stp.github.io/goesr-spwx-examples/examples/suvi/plot_suvi_l2_chbnd.html.

The Coronal Hole Boundary files are provided in netCDF format and contain the following datasets:

<code>cardinal_directions</code>	-	Dimension for <code>chbnd_extent_hg</code> , number of cardinal directions
<code>chbnd_area</code>	-	Coronal Hole area in <code>pix^2</code>
<code>chbnd_extent_hg</code>	-	Maximum extent in of each coronal hole in N (lat), S (lat), E (lon), W (lon) order, in Heliographic Stonyhurst coordinates
<code>chbnd_loc_car</code>	-	Coronal Hole boundaries in Carrington coordinates
<code>chbnd_loc_hg</code>	-	Coronal Hole boundaries in Heliographic Stonyhurst coordinates
<code>chbnd_loc_pix</code>	-	Coronal Hole boundaries in Pixel coordinates (referring to the pixels in the corresponding Thematic Map)
<code>degraded_status</code>	-	Marks if the file is considered degraded or not
<code>feature_number</code>	-	Dimension for number of coronal holes detected in the thematic map
<code>location</code>	-	Dimension for coronal hole coordinates (<code>x/y = 2</code>)
<code>num_chbnd</code>	-	Number of Coronal Holes found in the Thematic Map
<code>time</code>	-	Time in seconds after 01 Jan 2000 at 12 UTC (epoch time format, see python script for details)
<code>vertex</code>	-	Dimension, number of vertices for the associated coronal hole

Explanation of boundary vertices:

The boundary vertices are limited to between 6 and 16 points. The lower limit is to provide proper minimum representation of each boundary, the upper limit is due to legacy vertex array length limitations.

Users are invited and encouraged to report anomalies or send other comments or questions about the files and data therein to the SUVI team via the email address above. The NCEI team will update these files to correct known errors and address user comments on a best-effort basis. User feedback will drive changes and optimization of files for realtime distribution once this service commences.

KNOWN ISSUES

1. Pre ~Nov 2022, the 'time' variable (in seconds since 2000-01-01 12:00 UTC) was rounded in such a way that the hours/minutes were excluded. Validation was done with files after this time only, due to the need to correlate data with a SunPy map made with data from a similar time.
2. Occasionally, coronal hole boundaries are uncharacteristically small and/or thin, and do not properly surround the coronal hole determined by the thematic map. We are currently working on a fix for this issue.
3. There might be small variations in different coordinate systems due to differences in calculations done via textbook mathematical formulas vs. using SunPy/Astropy.
4. Helioprojective Cartesian coordinates are not yet implemented.

ACKNOWLEDGMENT & DATA USE POLICY

Do not redistribute these files. Refer all users to the NCEI file distribution site at:

<https://data.ngdc.noaa.gov/platforms/solar-space-observing-satellites/>

More information about the GOES-R Space Weather instruments and data is available at the NCEI website for GOES-R Space Weather data:

<https://www.ngdc.noaa.gov/stp/satellite/goes-r.html>

Where possible, users should acknowledge use of GOES data with the AAS Facilities keyword:

<http://journals.aas.org/authors/aastex/facility.html>

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CONTACTS FOR FURTHER INFORMATION

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NCEI website for GOES-R Space Weather data:

<https://www.ngdc.noaa.gov/stp/satellite/goes-r.html>