

GOES-16 SUVI Flare Location 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 Flare Location 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 (TM). 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_flloc.html.

The Flare Location files are provided in netCDF format and contain the following datasets:

bright_area	-	Area in pix ² of associated bright region
degraded_status	-	Marks if the file is considered degraded or not
euv_status	-	Marks if EUV flare was detected by the TM
feature_number	-	Dimension for number of flares detected in the TM
flloc_car	-	Flare location in Carrington coordinates
flloc_hg	-	Flare location in Heliographic Stonyhurst coordinates
flloc_pix	-	Flare location in Pixel coordinates (referring to the pixels in the corresponding TM)
flloc_rtheta	-	Flare location in R-Theta coordinates
location	-	Dimension for flare coordinates (x/y = 2)
num_flloc	-	Number of flare locations found in the TM
peak_flux	-	Peak bright region flux: radiance of the brightest pixel in that wavelength channel
peak_loc_car	-	Peak location in Carrington coordinates
peak_loc_hg	-	Peak location in Heliographic Stonyhurst coordinates
peak_loc_pix	-	Peak location in Pixel coordinates (referring to the pixels in the corresponding TM)
peak_loc_rtheta	-	Peak location in R-Theta coordinates
srs_status	-	Associated sunspot group number from SRS report
time	-	Dimension, time in seconds after 01 Jan 2000 at 12 UTC (epoch time format, see python script for details)
tot_flux	-	Total integrated bright region flux in which the flare is embedded, by wavelength
wavelength	-	Dimension, the six SUVI wavelengths in ascending order
xrs_status	-	Marks if flare was detected in XRS.07

Difference between Flare location and Peak location:

Peak location is simply the brightest pixel of the flaring region for each wavelength. The flare location is a weighted centroid of all pixels that were marked as flare in the TM, also for each wavelength.

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. There might be small variations in different coordinate systems due to differences in calculations done via textbook mathematical formulas vs. using SunPy/Astropy.
3. 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>