

## GOES-16 SUVI Composite Images Level 2 (L2) Data Release

March 30, 2021

### Read-Me for Data Users

The GOES-16 Solar Ultraviolet Imager (SUVI) is NOAA's operational solar extreme-ultraviolet imager. The SUVI files in these directories are high-dynamic range Composite Images, which are Level 2 products produced by NOAA's National Centers for Environmental Information in Boulder, Colorado. These data have been processed from Level 1b SUVI files produced by the GOES-R Ground Segment. The FITS file headers are populated with metadata to facilitate interpretation by users of these observations. Please note that these files might be considered experimental and thus might not have a permanent archive at NOAA. Users requiring assistance with these files can contact the NCEI SUVI team by emailing [goesr.suvi@noaa.gov](mailto:goesr.suvi@noaa.gov).

The SUVI Composite Image product is a Level 2 product in the form of a weighted average of SUVI Level-1b product files, resulting in high-dynamic range images encompassing the span of solar phenomena from the very faint such as coronal holes and extended corona dynamics to the most energetic, flares in the X-class range. All SUVI Composite Images are monochannel - multichannel composites are not an official SUVI Level 2 product. The production of SUVI Composites uses the following recipe:

1. The most recent SUVI L1b products for a single SUVI channel are collected. The SUVI Level 1b product contain data provided in estimated radiometric units of radiance ( $\text{W/m}^2 \text{sr}^{-1}$ ) and have had all appropriate calibration steps applied. SUVI's nominal observational sequence includes long (1 s) and short (0.005 s) exposures to extend the instrumental dynamic range during flares. Because data are converted to radiometric units, all data have been time-normalized.
2. The SUVI L1b images are co-aligned and averaged using a system of weights kept in lookup tables. The weights are tailored for each channel to favor the long exposure values in low-to-moderate signal regimes, and the short exposures for high-signal conditions (think flares).
3. The Composite Image file is written out with sufficient metadata to ensure the usefulness to end users. Much of the L1b metadata is carried over, as well as metadata to establish the provenance of the product.

Users are strongly 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. The SUVI instruments are susceptible to particle impacts that are most consistent with low-energy electrons. These impact the detector at an oblique angle resulting elevated signal in adjacent pixels.
2. Occasionally there is only one SUVI source file. This can lead errors in the final product.

## DATA NOTE & DISCLAIMER

These observations are not appropriate for space weather forecasting activities.

## 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:

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

Publication of the SUVI instrument paper is anticipated in 2019.

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>