

Weekly Report – {Date: Month #, 2022}
Satellite Climate Studies Branch (SCSB)/CISESS
NOAA/NESDIS/STAR
Acting Branch Chief: John Knaff

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HIGHLIGHTS FOR NESDIS LEADERSHIP

Unique & Significant Reports

Giant Lenticular Cloud: A giant lenticular cloud was seen in Maryland at about 5:50 pm on March 1st, 2022 (Fig. 1 and animation is available at <https://twitter.com/nesecond/status/1498845725823836163>). It was also detected by the GOES-East satellite (Fig.2, and animation is available at https://dlzhang.files.wordpress.com/2022/03/g16_sector_ne_geocolor_60fr_20220301-2115-1.gif). Lenticular clouds are common in the wintertime but can be seen all year around. They are formed when the air is moving fast and forced up by topographic barriers, such as mountains. This cloud was probably formed in the mountainous area in Virginia and moved to the east.

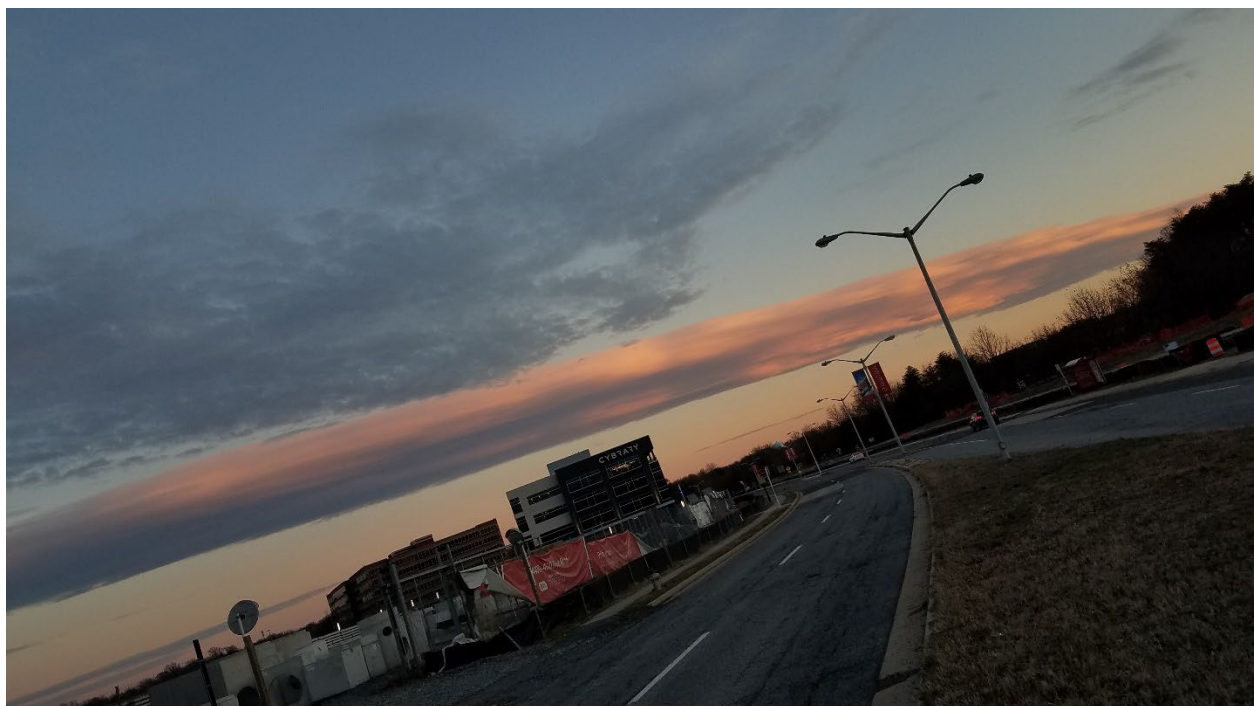
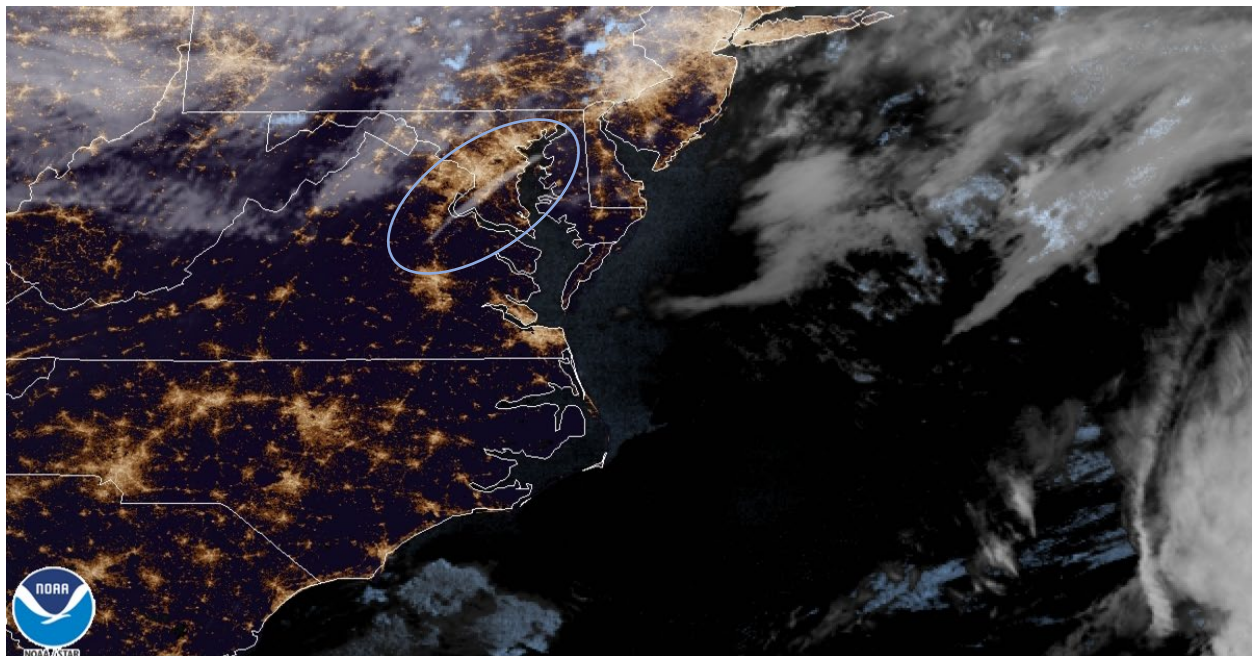


Fig. 1 A giant lenticular cloud in College Park, MD at 5:50 pm on March 1st, 2020.

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01 Mar 2022 22:46Z NOAA/NESDIS/STAR GOES-East GEOCOLOR

Figure 2: View of the lenticular cloud from GOES-R
(Daile Zhang, dlzhang@umd.edu, GOES-R AWG, GOES-R PGRR, NOAA-NASA ROSES).

PUBLICATIONS

Comparison of JPSS CrIS to GOES-R ABI for Radiometric Calibration

Citation: Wang, Zhipeng, Flavio Iturbide-Sanchez, Peter Beierle; Kum Zhang, and Denis Tremblay, 2022: Validation of CrIS radiometric performance through its comparison to ABI. *Remote Sens*, **14**, 876, <https://doi.org/10.3390/rs14040876> . **Summary:** CISESS Scientist Peter Beierle has a new publication, “Validation of CrIS Radiometric Performance through its Comparison to ABI,” which has been published in the journal *MDPI Remote Sensing*. Intercomparisons between the Cross Track Infrared Sounder instrument’s (CrIS) radiance products and the radiance products of other instruments is a valuable method to validate and monitor the stability and accuracy of their radiance products. This Paper explains the methodology and assessment of the intercomparison between the measured radiance products of the CrIS instruments onboard the low earth orbiting (LEO) SNPP and NOAA-20 satellites, and compares it to the infrared channels of the Advanced Baseline Imager (ABI) instruments onboard the geostationary (GEO) GOES-16 and GOES-17 satellites. Radiometric intercomparisons are performed between each CrIS-ABI pair. An established GSICS procedure for GEO/LEO intercomparisons is used. This involves utilizing collocating pixels (geolocated-overlapping earth scenes of both instruments), emulating the radiance of the ABI infrared bands using the CrIS spectra, and comparing this to the ABI radiance. Long-term time series of the CrIS minus ABI radiance bias was assessed. This procedure was performed in the ABI infrared bands within the spectral range from 3.7 μm to 13.3 μm . The bias was found to be within 0.2 K throughout, except for the ABI bands with known calibration issues. In addition, different calibration events that have occurred in the history of the ABI and CrIS instrument’s lifetimes can be seen in these time series. An example of the value of these intercomparisons can be seen in the

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figure below, which shows the intercomparison between GOES-16 ABI and SNPP CrIS in the MWIR spectral range before and after the 21 May 2021 SNPP Side-2 CrIS LWIR failure. These intercomparisons were valuable in monitoring the state of the CrIS radiance products during the failure (which can be compared to beforehand), as well as the restoration of the LWIR band and the side switch, which is useful for the validation of the CrIS SDR products post-anomaly. Although the main goal of this work is to support the on-orbit Cal/Val of CrIS, including the future JPSS-2/3/4 CrIS, such observations can also be referenced to further improve the calibration of ABI.

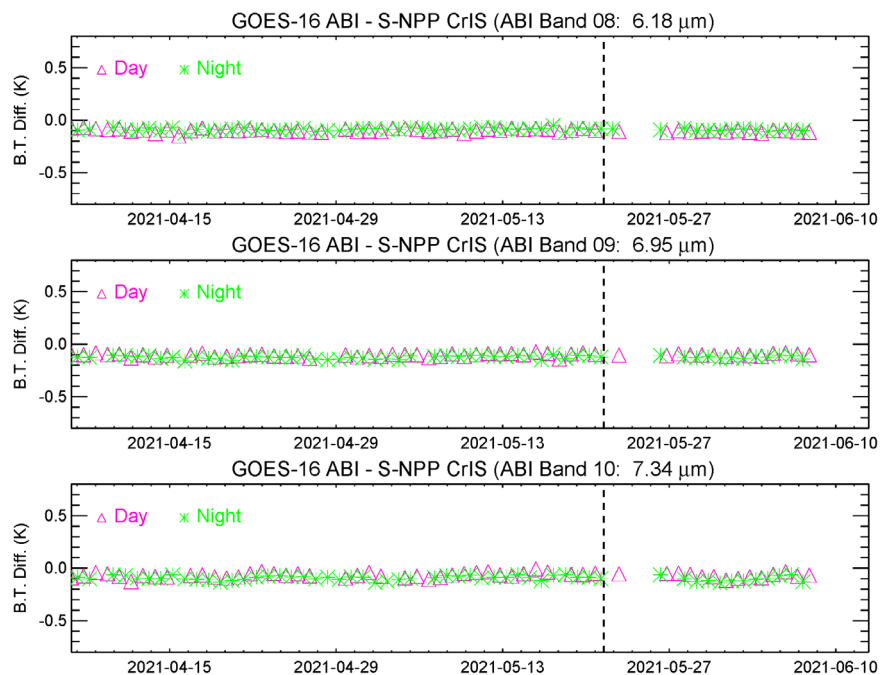


Figure: The intercomparison between GOES-16 ABI and SNPP CrIS in the MWIR spectral range, before and after the 21 May 2021 SNPP CrIS LWIR failure as indicated by the vertical dash-line. (Peter Beierle, peter.beierle@noaa.gov, JSTAR)

Citation: Daile Zhang, 2022: The Legacy of the Chinese Lightning and Thunder Gods. *Weatherwise*, **75**:2, 24-28, <https://doi.org/10.1080/00431672.2022.2021772> . **Summary:** CISESS Lightning Scientist Daile Zhang has a new article in *Weatherwise* discussing the legacy of ancient stories and legends of Lei Gong, The Thunder Lord, and Dian Mu, The Electricity Mother.

(Daile Zhang, dlzhang@umd.edu, GOES-R AWG, GOES-R PGRR, NOAA-NASA ROSES).