Weekly Report

CISESS
Cooperative Research Program Division (CoRP)
STAR/NESDIS
National Oceanic and Atmospheric Administration (NOAA)

Submitted by: Hugo Berbery
Prepared by: Debra Baker
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Products and Applications

Updated SFR Algorithms Delivered: An updated Enterprise SnowFall Rate (SFR) package was delivered to the MiRS team on June 21. Some of the major updates include:

- The final JPSS-2 ready algorithm;
- Machine Learning (ML) NOAA-20 and S-NPP ATMS Snowfall Detection over CONUS; and
- Parameter initializations and bias corrections, some using ML techniques, for NOAA-20, S-NPP, NOAA-19, Metop-A, Metop-B, and Metop-C

The use of ML techniques significantly improves both snowfall detection and rate estimation. Besides improving performance statistics, it also expands the algorithm applicable conditions to much colder range than the existing product. Figure 1 compares S-NPP SFR from the operational algorithm (left) with the updated version (middle) and the Stage IV radar and gauge combined precipitation product (right). The operational SFR missed the snowfall in the southwestern Montana (that was detected by the new algorithm) because the surface temperature was below the threshold.

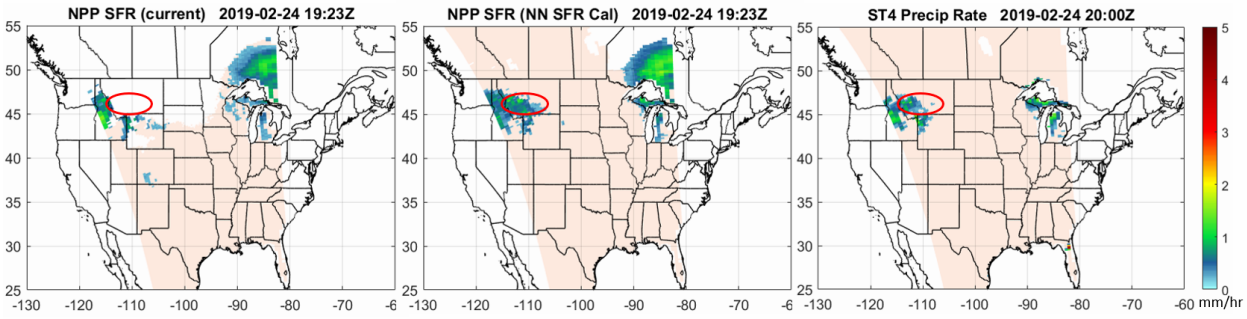


***Figure 1**. S-NPP SFR on February 24, 2019 at 19:23Z from the operational algorithm (left), the updated algorithm (middle), and the corresponding Stage IV product. The operational SFR missed the snowfall in the southwestern Montana due to cold condition while the new algorithm was able to detect the snowfall.*

Figure 2 shows the S-NPP SFR from a different snowstorm. The updated SFR agrees better with Stage IV in magnitude than the operational version.

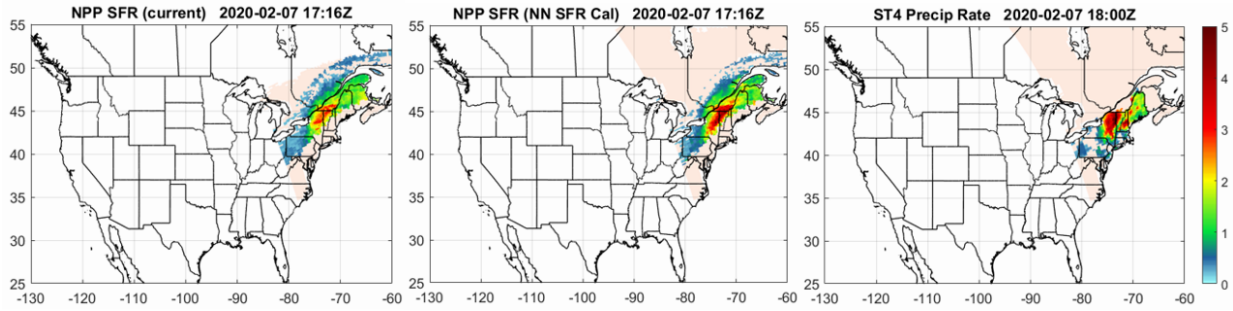


Figure 2*. S-NPP SFR on February 7, 2020 at 17:16Z from the operational algorithm (left), the updated algorithm (middle), and the corresponding Stage IV product. The updated SFR agrees better with Stage IV in magnitude than the operational version.*

(POC: H. Meng, Y. Fan, J. Dong, C. Kongoli, R. Ferraro, huan.meng@noaa.gov , Funding sources: STAR JPSS, NOAA HPCC)

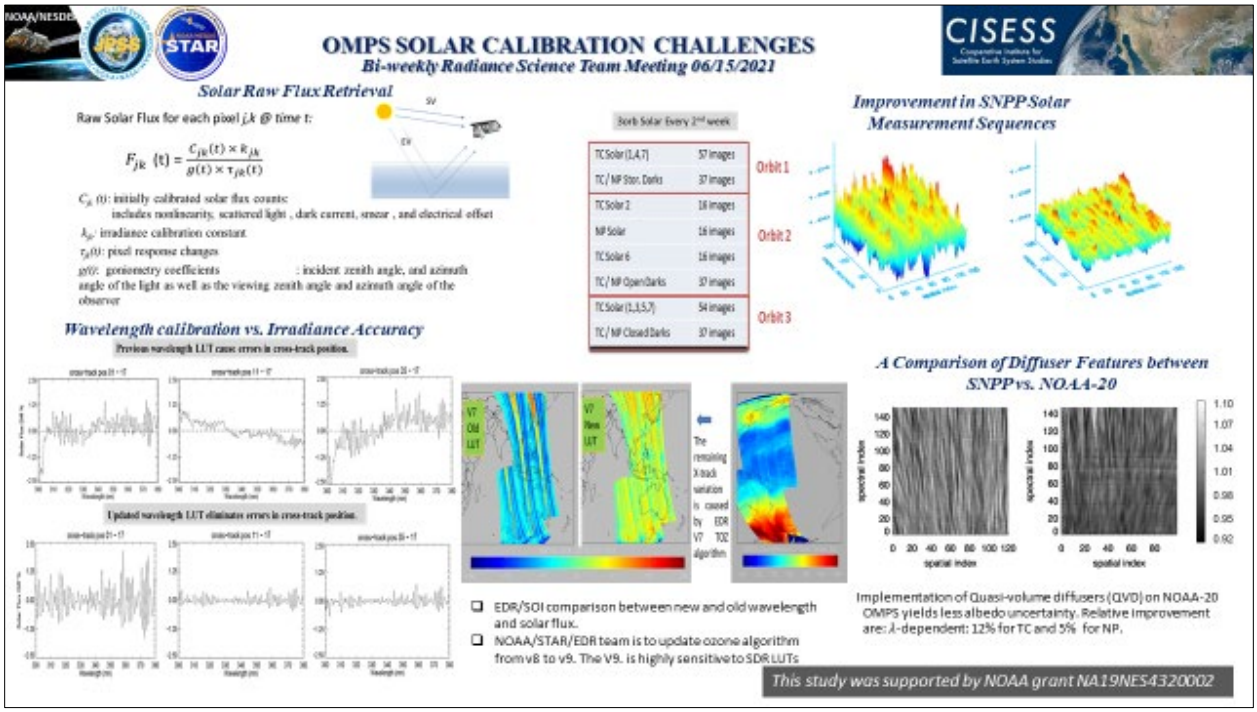
Workshops, Conferences, and Meetings

Fall Meeting Session – Precipitation Through the Eyes of Machine Learning and Advanced Statistics: Remote Sensing, Uncertainties and Variability

CISESS scientist Veljko Petkovic is a primary convener for the AGU Fall Meeting 2021 session on Machine Learning applications on precipitation processes. This session will highlight contributions on precipitation-related AI/ML studies seeking physical implications, model interpretations, visualizations, remote sensing applications and uncertainty analyses that can identify novel elements in understanding of precipitation processes. It calls for studies that can link the information content of observational/modeled datasets to the physical causes and/or materializations of storm properties. These include, but are not limited to, studies on radiative-, hydrometeor-, cloud-, and hydrological-responses to precipitation processes. Abstracts are due August 4th. Session details:
https://agu.confex.com/agu/fm21/prelim.cgi/Session/119636

(*POC: Veljko Petkovic, veljko@umd.edu, Ralph Ferraro ralph.r.ferraro@noaa.gov, Funding: HPCC & EPS-SG)*

OMPS Solar Calibration Challenges: CISESS Scientist Chunhui Pan (STAR/SMCD) delivered an oral presentation (21 slides) to the JSTAR Radiance Science Team at their biweekly meeting on June 15. The presentation was requested by STAR and was entitled “OMPS Solar Calibration Challenges”. See the summary slide below.



(*POC: Chunhui Pan, chunhui.pan@noaa.gov , Funding: JSTAR)*