CICS Science Conference
November 29, 30 & December 1, 2016
College Park, MD, USA

Abstract: **Development and Preliminary Evaluation of the Enterprise VIIRS LST Algorithm**

Yuling Liu[1,2], Yunyue Yu[2], Peng Yu[1,2], Heshun Wang[1,2]

[1]University of Maryland, College Park
[2]NOAA/NESDIS/STAR, Maryland

Land surface temperature (LST) is one of the most important parameters in the weather and climate system controlling surface heat and water exchange with the atmosphere. It has been widely used in a variety of fields such as numerical weather prediction models and data assimilation systems, irrigation and hydrological cycle particularly agricultural drought monitoring, and urban heat island monitoring.

Satellite LSTs have been routinely produced for over forty years from a variety of polar-orbiting and geostationary satellites. For producing an LST climate data record from these programs, consistency of the LST products from different satellite missions are considered for better cross-satellite evaluation and better geographic global validation. The enterprise LST algorithm is designed for the Joint Polar-orbiting Satellite System (JPSS) VIIRS sensor. It is expected to be applicable to the GOES-R Advanced Baseline Imager (ABI) as well with minor changes corresponding to the input data stream differences and sensor characterizations.

In this study, the theoretical analysis is conducted to evaluate the algorithm uncertainty attributed to the regression model, sensor noise, emissivity uncertainty and water vapor uncertainty. The preliminary validation is performed through the comparison with the ground LST observations from SURFace RADiation network (SURFRAD), Baseline Surface Radiation Network (BSRN) and Global Monitoring Division (GMD) radiation network, and cross comparisons with the Moderate Resolution Imaging Spectroradiometer (MODIS) LST and Spanning Enhanced Visible and Infrared Imager (SEVIRI) LST.