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2-5 Validation of Aerosol Optical Thickness and Angström Exponent in the Suomi-NPP VIIRS Operational Aerosol Products

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The Suomi National Polar-orbiting Partnership (NPP) Visible Infrared Imaging Radiometer Suite (VIIRS) instrument began collecting data shortly after its launch in October 2011 and its aerosol products have been available to public since May 2, 2012. The NPP/VIIRS operational aerosol products include aerosol optical thickness (AOT) at 11 wavelengths, aerosol size parameter (Angström Exponent, AE) and type-related information (Suspended Matter). VIIRS aerosol retrieval is performed at pixel level (~0.75 to 1.6 km from nadir to edge), and aggregates to an Environment Data Record (EDR) resolution (~6 to 12.8 km from nadir to edge). This talk highlights the main findings in the comparison of VIIRS AOT and AE to the Aerosol Robotic Network (AERONET) Level 2.0 measurements spanning 05/02/2012 to 08/31/2014 over ocean and 01/23/2013 to 08/31/2014 over land. The VIIRS AOT and AE products were also compared to other operational satellite aerosol retrievals from MODIS and MISR and demonstrated competitive performance. Accuracy and uncertainty of the VIIRS AOT and AE EDRs were evaluated against the JPSS Specification Thresholds for performance assessment. The results from the Cal/Val activities supported the latest approval from the NOAA JPSS Program that the S-NPP VIIRS AOT EDR reaches Validated Stage II (01/23/2013 onwards over land and 05/02/2012 onwards over ocean, not including the anomaly period of 10/15/2012-11/27/2012) and the AE EDR over ocean reached Validated Stage I since 05/02/2012 (not including the anomaly period of 10/15/2012-11/27/2012). More details of the thorough regional and temporal characterization of the aerosol products will be reported in the talk. With continued algorithm refinements, the NPP/VIIRS aerosol products are providing a valuable asset to the data user community in meeting the operational and research needs of air quality, weather forecasting, and climate impact studies.