Abstract: Development and Assessment of Precipitation Products from the NOAA Microwave Integrated Retrieval System (MiRS) Algorithm

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The Microwave Integrated Retrieval System (MiRS) has been the NOAA official operational microwave retrieval algorithm since 2007 and is currently run operationally on microwave data from NOAA, Metop, DMSP and Suomi-NPP polar orbiting satellites, and on data from Megha-Tropiques/SAPHIR. It has also recently been extended to data from Global Precipitation Mission (GPM)/GMI, and will be further extended to JPSS-1/ATMS in anticipation of launch in Spring 2017. The inversion within MiRS follows a 1D-variational methodology, in which the fundamental physical attributes affecting the microwave observations are retrieved directly, including the profile of atmospheric temperature, water vapor, hydrometeors, as well as surface emissivity and temperature. The Community Radiative Transfer Model (CRTM) is used as the forward and adjoint operators. A post-processing step is then performed to determine a number of additional derived parameters, including surface precipitation rate. The precipitation rate determination is sensor-independent in that the same relationships between the surface precipitation rate and the vertical hydrometeor profiles are used throughout. In this presentation we will report on assessment and validation of the MiRS precipitation rate product, including comparisons with ground-based measurements such as the Stage IV radar-gauge product, with a particular emphasis on results from Suomi-NPP/ATMS, and GPM/GMI. Evaluations will be based on performance seen over both short-term (intraseasonal) and longer-term (interseasonal) time periods. Additional discussion will focus on potential avenues for improvement based on results from validation and sensitivity testing.