A Quality Control Study of NOAA MIRS Cloudy Retrievals during Hurricane Sandy

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Cloudy radiancies present a difficult challenge to data assimilation (DA) systems, through both the non-linear radiative transfer behaviors as well the complex hydrometer interactions required to resolve the clouds and precipitation. In most DA systems the hydrometers are not control variables due to many limitations.

The National Oceanic and Atmospheric Administration's (NOAA) Microwave Integrated Retrieval System (MIRS) is producing products from the Suomi-NPP ATMS satellite sensor when the scene is cloud and precipitation affected. We present a test case from Hurricane Sandy in October 2012.

As a quality control study we compare the retrieved water vapor content with the first guess and the analysis from the NOAA Gridpoint Statistical Interpolation (GSI) system during the lifetime of Hurricane Sandy. The assessment involves the gross error check system against the first guess with different values for the observational error's variance to see if the difference is within three standard deviations. We also compare against the final analysis at the relevant cycles to see if the products which have been retrieved through a cloudy radiance are similar, given that the GSI system does not assimilate cloudy radiances yet.