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3-1 Intercalibrating and Validating SAPHIR and ATMS Observations

We present the results of evaluating observations from microwave instruments aboard the Suomi National Polar-orbiting Partnership (NPP, ATMS instrument) and Megha-Tropiques (SAPHIR instrument) satellites.

ATMS is a cross-track microwave sounder that currently flying on the Suomi National Polar-orbiting Partnership (S-NPP) satellite, launched in October 2011, which is in a Sun-synchronous orbit with the ascending equatorial crossing time at 01:30 a.m. Megha-Tropiques, launched in Nov 2011, is a low-inclination satellite meaning that the satellite only visits the tropical band between 30 S and 30 N. SAPHIR is a microwave humidity sounder with 6 channels operating at the frequencies close to the water vapor absorption line at 183 GHz. Megha-Tropiques revisits the tropical regions several times a day and provide a great capability for inter-calibrating the observations with the polar orbiting satellites.

The study includes inter-comparison and inter-calibration of observations of similar channels from the two instruments, evaluation of the satellite data using high-quality radiosonde data from Atmospheric Radiation Measurement Program and GPS Radio Occultaion Observations from COSMIC mission, as well as geolocation error correction. The results of this study are valuable for generating climate data records from these instruments as well as for extending current climate data records from similar instruments such as AMSU-B and MHS to the ATMS and SAPHIR instruments.