



Passive Microwave Rainfall Estimates from the GPM Mission

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The Global Precipitation Measurement (GPM) mission was launched in February 2014 as a joint mission between JAXA from Japan and NASA from the United States. GPM carries a state of the art dual-frequency precipitation radar and a multi-channel passive microwave radiometer that acts not only to enhance the radar's retrieval capability, but also as a reference for a constellation of existing satellites carrying passive microwave sensors. In March of 2016, GPM released Version 4 of its precipitation products that consists of radar, radiometer, and combined radar/radiometer products. The precipitation products from these sensors or sensor combination are consistent by design and show relatively minor differences in the mean global sense. Closer examination of the biases, however, reveals regional biases between active and passive sensors that can be directly related to the nature of the convection. By looking at cloud systems instead of individual satellite pixels, the relationship between biases and the large scale environmental state become obvious. Organized convection, which occurs more readily in regimes with large Convective Available Potential Energy (CAPE) and shear tend to drive biases in different directions than isolated convection. This is true over both land and ocean. This talk will present the latest findings and explore these discrepancies from a physical perspective in order to gain some understanding between cloud structures, information content, and retrieval differences. This analysis will be used to then drive a bigger picture of how GPM's latest results inform the Global Water and Energy budgets.