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# Assessment of Remote Sensing Systems Version-7 Rain Rates

Kyle Hilburn, Deborah Smith, and Thomas Meissner
Remote Sensing Systems, Santa Rosa, CA, United States (hilburn@remss.com)

This year, Remote Sensing Systems (RSS) completed the development of its latest generation of passive microwave satellite data products: Version-7 (V7). Data are now freely available on our website www.remss.com for SSM/I F08 through F15, SSMIS F16 and F17, AMSR-E, and WindSat. V7 has been reprocessed with a consistent methodology for all sensors. All of the calibration adjustments made in V7 are based on physical effects, including: a) error in pre-launch determination of antenna spillover, b) error in the specification of the effective hot load temperature on orbit, c) error due to direct emission from the antenna, and d) error due to spacecraft and calibration targets entering the field of view during part of the scan. The methodology for deriving these calibration adjustments is based on comparing satellite observations to a common radiative transfer model over the rain-free ocean. Thus, assessment of RSS rain retrievals provides a particularly strong test of the intercalibration, since these observations were not used in the inter-calibration. We will show that the inter-satellite differences in V7 rain rates are considerably smaller than in Version-6 (V6).

In addition to assessing the inter-calibration of V7 rain rates, our presentation will also assess the effect of changes made to the rain algorithm in V7. A change made to the beamfilling correction in our rain algorithm has increased the contribution of light rain rates (< 5 mm/hour) towards the mean rate at middle and high latitudes. This has increased the extratropical mean rain rate by about 30%, while leaving tropical mean rain rates unchanged to within 1%. The total effect of these changes has increased the global mean rain rate in V7 by 16% over V6. We will present ground validation of RSS V7 rain retrievals compared with in situ rain gauge measurements from TAO, TRITON, PIRATA, and RAMA buoys across the tropics, PACRAIN gauges on small tropical islands, and against coastal GPCC gauges in the middle latitudes. We will show that, as in V6, tropical rain rates are in good agreement with gauges on buoys; and that the higher extratropical rain rates in V7 are more consistent with GPCC gauges.