



GPM Intercalibrated Radiometer Brightness Temperatures

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One of the keys to consistent precipitation retrieval from passive microwave radiometer measurements (whether imagers or sounders) is accurate, long-term consistent brightness temperature retrievals. This becomes doubly important when these measurements are taken from radiometers on multiple platforms, from multiple agencies, with many different purposes. The Global Precipitation Measurement (GPM) mission addresses this issue directly with the production of intercalibrated brightness temperatures from all the partner satellites contributing to the GPM mission. These intercalibrated brightness temperatures are given the product designation: 1C within GPM. This paper will describe the GPM approach to intercalibration 1C products.

The intercalibration and creation of the products uses a 5-step methodology: comparison of the partner standard products (either Tb or Ta) with the GPM reference standard; determination of adjustments that should be made to each product to create consistent brightness temperatures; re-orbitization of all orbits (in non-realtime) to be in the standard GPM south-south orbit; application of the adjustments to the partner provide 1B(or 1A) products; production of 1C products in HDF5 using a "standard" logical format for any radiometer regardless of its 1B format.

This paper describes each of these steps and provides the background for them. It discusses in some detail the current 1C logical format and why this format facilitates use by downstream product algorithms and end-users. Most importantly it provides the analysis approach established by the GPM inter-calibration working group in establishing the adjustments to be made at the 1C level.

Finally, using DMSP F16-18, it provides examples of the 1C products and discusses the adjustments that are made.