# Elucidating Errors and Uncertainties Through Deconstruction of Precipitation Products

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**Abstract**

The generation and quantification of errors and uncertainties within satellite and surface precipitation data sets is of great importance to the user community. Much work has been done to devise models to determine the errors associated with precipitation retrievals, such as those derived from satellite observations. However, although these models of useful, they do not always faithfully represent the true errors associated with the precipitation products for a particular time period and for particular regions. This presentation first outlines the identification of errors and uncertainties with surface reference data sets which are fundamental to the calibration, verification and validation of satellite-derived precipitation estimates. Once high-quality surface data has been identified, in this case for a region over France and Germany, precipitation products from the TRMM Merged Precipitation Analysis (TMPA) are deconstructed. The TMPA product is a merged technique – one that combines optimal information from a number of different sources – including passive microwave imagers, passive microwave sounders and infrared observations. Each of these inputs has their own error characteristics through their retrieval scheme. In addition, the timing of each of these individual products to the final merged product introduces some errors and uncertainties; over the Tropics there is little diurnal bias, however over mid-latitudes a 2% positive bias is seen in modelled results. Additional analysis shows how the errors and certainties of the individual components of the TMPA product can be identified and quantified.

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