

Title: A Convective or Stratiform Prototype Scheme for IMERG
Authors: Jackson Tan, George Huffman, Lazaros Oreopoulos
Type of Submission: Presentation
Main Abstract Topic: Algorithm Improvement

The Integrated Multi-satellite Retrievals for GPM (IMERG) provides estimates of surface precipitation rate at 0.1° every half-hour globally as well as related characteristics such as the precipitation phase, but one key property that is lacking is the convective or stratiform (C/S) type classification. Beyond providing an indication of the nature of the precipitation, C/S type allows for further applications such as in the computation of latent heating profiles and C/S-based bias correction. C/S type is often diagnosed from active retrievals by observing the three-dimensional structure of the reflectivity field, but its retrieval from passive observations remains in active development.

In this presentation, we describe a prototype scheme to produce a C/S classification at 0.1° every half-hour globally, thereby complementing the IMERG precipitation estimates. By applying a convolutional neural network model trained with the GPM DPR C/S type to the merged geostationary IR brightness temperature and IMERG precipitation estimates, this scheme predicts the C/S probability primarily using the texture of the cloud and precipitation fields. Compared to DPR overpasses, the scheme can broadly identify the regions of C/S within a precipitation system, achieving a high accuracy and a reasonable Heidke Skill Score.

With the aim of implementing this scheme operationally in IMERG V08, we will discuss how it may interact with existing efforts at estimating the C/S type from passive microwave observations. We will also examine possible limitations associated with the use of DPR as a reference and artifacts associated with the use of IMERG precipitation.