

Three Research Topics to Advance Satellite Precipitation Retrieval Algorithms

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The NASA/JAXA Global Precipitation Mission (GPM) successfully estimates surface rainfall and has met all of its Level 1 requirements. However, new scientific applications of GPM precipitation retrievals are possible by improving precipitation retrieval algorithm parameterizations and assumptions. The Particle Size Distribution Working Group (PSDWG) aims to advance GPM retrieval algorithms by analyzing Ground Validation observations with techniques focused on isolating physical processes so that Satellite Algorithm developers can evaluate and adjust their algorithms. The PSDWG meets monthly to facilitate cross-discipline communication between GPM Ground Validation and Satellite Algorithm communities.

In March 2020, at the beginning of the COVID-19 travel restrictions, the PSDWG hosted the NASA GPM Cal/Val and Algorithm Virtual Workshop. The 70+ scientists identified three priority research topics that could help advance GPM precipitation products over the next few years. Scientists formed three ad hoc research groups with volunteer leaders during the last workshop session. These small groups have met quarterly during the pandemic and presented their insights at PSDWG monthly meetings twice a year.

The three priority research topics are: (1) Improve *DSD parameters* retrieved in the Radar, Combined, and GPROF algorithms (lead: Patrick Gatlin), (2) Improve estimates across the *Blind Zone* from the lowest resolved gate to the surface (leads: Mircea Grecu and Steve Durden), and (3) Improve *Phase Discrimination* in all algorithms (lead: Pierre Kirstetter).

The proposed IPWG / IWSSM contribution will summarize highlights from these priority research topics and solicit input for course directions in future Ground Validation and Satellite Algorithm development activities.