



Resolving extreme rainfall from space: a new class of algorithms for precipitation retrieval over radiometrically complex terrain and coastal areas

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The increasing availability of precipitation observations from the Global Precipitation Measuring (GPM) Mission, has fueled renewed interest in developing frameworks for accurate estimation of precipitation extremes especially over ungauged mountainous terrains and coastal regions to improve hydro-geological hazard prediction and control. Our recent research has shown that treating precipitation retrieval and data fusion/assimilation as inverse problems and using a regularized variational approach with the regularization term(s) selected to impose desired constraints on the solution, leads to improved representation of extremes. Here we present some new theoretical and computational developments which extend the ideas to a framework of retrieval via a regularized search within properly constructed data bases. We test the framework in several tropical storms over the Ganges-Brahmaputra delta region and over the Himalayas and compare the results with the standard retrieval algorithms currently used for operational purposes.