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Advancing the next generation of global precipitation measurements

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The derivation of satellite precipitation estimates has evolved from humble beginnings with single-channel empirical techniques into complex multi-sensor, multi-satellite techniques producing precipitation estimates over a range of temporal and spatial scales. In order to verify the range of algorithms and techniques, a number of validation and inter-comparison projects have taken place of the last 20 years, each contributing information on the performance of the different retrieval techniques: this has lead to significant improvements in the precipitation algorithms themselves.

However, a number of issues remain as to the derivation of global precipitation which cannot be achieved through satellite observations alone. Although the combination of satellite and (rain) gauge information is not new, the development of techniques to use all available information is in its infancy. Such improvements call for a holistic approach, blending static information (location, geography, surface), dynamic information (weather systems), outputs from numerical weather prediction models, with that of the satellite and surface observation of precipitation. This paper outlines the first steps being taken to incorporate such information. In particular, attention is made to the temporal and spatial scales necessary to meet the needs and requirements of the use community; retrievals of precipitation over poorly-observed, or “challenging” regions (such as snow and ice) and; improving estimates in regions of known issues (e.g. orography, virga).