

Inter-comparison of high resolution multi-satellite rainfall products for extreme rainfall and southwest monsoon period over India

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India receives most of its rainfall during summer monsoon season (June to September). The summer monsoon rainfall has great socioeconomic impact on the Indian subcontinent and plays a vital role in agriculture of India. Multi-satellite rainfall products provide rainfall with high temporal and spatial resolutions; however they exhibit on regional and seasonal biases. Hence calibration of these products with ground-based observations can improve the accuracy of the rainfall estimation.

Following the launch of the Global Precipitation Measurement (GPM) Core Observatory, two advanced version high resolution multi-satellite precipitation products namely, Integrated Multi-satellite Retrievals for GPM (IMERG) version 4 and Global Satellite Mapping of Precipitation (GSMaP) version 6 are released. In the present study an attempt is made to inter comparison the spatial & temporal structures of rainfall in near real time and research versions of IMERG (NRT & FNL), GSMaP (MVK& gauge), INSAT3D(IMR & HEM) and Merged (IMD-NCMRWF) with gridded gauge-based IMD rainfall data for extreme rainfall assessment in Deep Depression and cyclones. And also inter comparison of above products on daily, monthly and seasonal scales for southwest monsoon period. Comparison reveals that the Merged, GSMaP gauge and final product of IMERG produces the observed rainfall compared to other products. In addition, different skill scores such as mean, bias, correlation coefficient, RMSE, and categorical skill score such as POD, FAR, FBI, and CSI are computed for GSMaP, IMERG, INSAT3D and Merged products. Over all Merged, GSMaP gauge and IMERG FNL products show better results compared to INSAT3D. The INSAT3D products overestimated the mean rainfall and GSMaP-MVK underestimated the mean rainfall over most of the regions on monthly as well as seasonal scales.

Keywords: Multi-satellite rainfall , Global Precipitation Measurement(GPM), INSAT3D