EGU22-463
https://doi.org/10.5194/egusphere-egu22-463
EGU General Assembly 2022

Performance evaluation of GPM IMERG precipitation over the tropical oceans

Rajani Kumar Pradhan and Yannis Markonis
Czech University of Life Sciences Prague, Faculty of Environmental Sciences, Department of Water Resources and Environmental Modeling, Praha, Czechia (pradhan@fzp.czu.cz)

A major proportion of the global precipitation falls at the tropical oceans. Nonetheless, due to the lack of in-situ precipitation measurements, studies over the ocean and so over the tropical oceans remain limited. Among others, the Integrated Multi-Satellite Retrievals for GPM (IMERG) is currently one of the best satellite estimates and has been widely applied in various research applications. However, its performance over the ocean, and specifically, over the tropical oceans is yet to be known. Thus, in this study, we quantitatively evaluate the IMERG V06 Early, Late and Final products using along-track shipboard data (OceanRain dataset) and in-situ data (buoy observations from the Global Tropical Moored Buoy Array; GTMBA) across the tropical oceans. The GTMBA data involve the Tropical Atmosphere Ocean/Triangle Trans-Ocean Buoy Network (TAO/TRITON) in the Pacific, the Prediction and Research Moored Array in the Tropical Atlantic (PIRATA), and the Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction (RAMA) in the Indian Ocean. We examine the IMERG error characterization and bias distribution across the daily, monthly, and seasonal scales over the tropical oceans. Subsequently, we investigate the IMERG performance for light and extreme precipitation, both in terms of intensity and frequency. The evaluation of the IMERG data with OceanRain and buoys constitute both point-area and grid-grid based approaches. The categorical indices, which used to evaluate the detection capability of IMERG include the Probability of Detection (POD), the False Alarm Ratio (FAS) and the Critical Success Index (CSI). This study will bring out important information for the user community, the GPM ground validation group, and algorithm developers regarding the IMERG performances and thus its applicability over an 'untraditional' region such as oceans.

Key words: GPM, IMERG, Precipitation, OceanRain, Buoys, Remote sensing