



Validation of satellite-borne precipitation radars by raingauges and disdrometers over the northeastern Indian subcontinent

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The near surface rain (NSR) dataset of the Tropical Rainfall Measurement Mission (TRMM) Precipitation Radar (PR) and the Global Precipitation Mission (GPM) Dual Precipitation Radar (DPR) was validated using around 40 tipping bucket raingauges installed over the northeastern Indian subcontinent, and disdrometers in the Meghalaya Plateau, India. The comparison during 2006-2014 showed significant overestimation of TRMM PR in Assam and Bengal plains during pre-monsoon season (March to May), and significant underestimation of TRMM PR over the Indian subcontinent during monsoon season (June to September). Whereas, the comparison during 2014-2019 showed significant overestimation of GPM DPR over only Meghalaya during monsoon season. The validation of rain-drop size distribution parameters: D_m and N_w showed positive correlation between GPM DPR derived values and Parsivel disdrometers observed ones, while unrealistic concentration of N_w on 30-40 dB was derived by GPM DPR. In the southern slope of the Meghala Plateau, NSR of TRMM PR at Cherrapunji, where is known as the heaviest rainfall station, on the plateau observed smaller rainfall than that in the adjacent valley. However, newly installed raingauges in the valley showed rather less rainfall than that on the plateau. The validity of the satellite derived rainfall distribution over the complicated terrain are discussed.