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Intercomparison of Trend Analysis using Multi Satellite Precipitation Products and Gauge Measurements

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Abstract: This study evaluates the capability of four multi-satellite precipitation products using gridded rain gauge data collected by India Meteorological Department (IMD) for the period of 2000–2018 at monthly scale with the spatial resolution (0.25° × 0.25°). The gridded precipitation datasets are compared for all districts of Andhra Pradesh region. TRMM, CHIRPS, PERSIANN, and MSWEP datasets accuracy for the districts are measured by comparing with IMD using mean absolute error (MAE), root mean square error (RMSE) and correlation coefficient (CC). To evaluate the data pattern, the Mann-Kendall (MK) test is applied, and magnitude of change is detected by Sen's Slope using all datasets for annual and seasonal time periods. The monthly Correlation Coefficient between these Satellite datasets and IMD has shown above 0.80. CHIRPS and TMPA are better comparable to gauge-based precipitation than any other datasets. The annual and monsoon trend pattern for TMPA, CHIRPS, PERSIANN and MSWEP matched with IMD data in the coastal and northwest districts. The products of TMPA and CHIRPS showed better performance relative to IMD than MSWEP and PERSIANN, thus suitable for use in hydrometeorological studies in the data-scarce area of the state.

***Keywords*:** Precipitation, IMD, TRMM, CHIRPS, MSWEP, Trend analysis