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Hourly Comparison of GPM-IMERG-Final-Run and IMERG-Real-Time (V-03) over a Dense Surface Network in Northeastern Austria

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Accurate quantitative daily precipitation estimation is key to meteorological and hydrological applications in hazards forecast and management. In-situ observations over mountainous areas are mostly limited, however, currently available satellite precipitation products can potentially provide the precipitation estimation needed for meteorological and hydrological applications. Over the years, blended methods that use multi-satellites and multi-sensors have been developed for estimating of global precipitation. One of the latest satellite precipitation products is GPM-IMERG (Global Precipitation Measurement with 30-minute temporal and 0.1-degree spatial resolutions) which consists of three products: Final-Run (aimed for research), Real-Time early run, and Real-Time late run. The Integrated Multisatellite Retrievals for GPM (IMERG) products built upon the success of TRMM's Multisatellite Precipitation Analysis (TMPA) products continue to make improvements in spatial and temporal resolutions and snowfall estimates. Recently, researchers who evaluated IMERG-Final-Run V-03 and other precipitation products indicated better performance for IMERG-Final-Run against other similar products. In this study two GPM-IMERG products, namely final run and real time-late run, were evaluated against a dense synoptic stations network (62 stations) over Northeastern Austria for mid-March 2015 to end of January 2016 period at hourly time-scale. Both products were examined against the reference data (stations) in capturing the occurrence of precipitation and statistical characteristics of precipitation intensity. Both satellite precipitation products underestimated precipitation events of 0.1 mm/hr to 0.4 mm/hr in intensity. For precipitations 0.4 mm/hr and greater, the trend was reversed and both satellite products overestimated than station recorded data. IMERG-RT outperformed IMERG-FR for precipitation intensity in the range of 0.1 mm/hr to 0.4 mm/hr while in the range of 1.1 to 1.8 mm/hr, IMERG-FR was closer to the ground data. The results also showed that the cumulative distribution function (CDF) of both IMERG products' were well above that of the stations' precipitation. However, at 94% frequency level, ground data was less than 2.5 mm/hr which corresponded to 88% frequency level in IMERG-Cal and IMERG-RT. Below 2.5 mm/hr, IMERG-RT was slightly lower than the IMERG-FR whereas IMERG-RT was above IMERG-FR at higher precipitation levels. The result showed an overall overestimation of the precipitation frequency by both IMERG-FR and IMERG-RT.