Geophysical Research Abstracts
Vol. 18, EGU2016-9963-1, 2016
EGU General Assembly 2016

Data Analysis of GPM Constellation Satellites-IMERG and ERA-Interim precipitation products over West of Iran

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Precipitation is a critical component of the Earth's hydrological cycle. The primary requirement in precipitation measurement is to know where and how much precipitation is falling at any given time. Especially in data sparse regions with insufficient radar coverage, satellite information can provide a spatial and temporal context. Nonetheless, evaluation of satellite precipitation is essential prior to operational use. This is why many previous studies are devoted to the validation of satellite estimation. Accurate quantitative precipitation estimation over mountainous basins is of great importance because of their susceptibility to hazards. In situ observations over mountainous areas are mostly limited, but currently available satellite precipitation products can potentially provide the precipitation estimation needed for meteorological and hydrological applications. One of the newest and blended methods that use multi-satellites and multi-sensors has been developed for estimating global precipitation. The considered data set known as Integrated Multi-satellitE Retrievals (IMERG) for GPM (Global Precipitation Measurement) is routinely produced by the GPM constellation satellites. Moreover, recent efforts have been put into the improvement of the precipitation products derived from reanalysis systems, which has led to significant progress. One of the best and a worldwide used model is developed by the European Centre for Medium Range Weather Forecasts (ECMWF). They have produced global reanalysis daily precipitation, known as ERA-Interim. This study has evaluated one year of precipitation data from the GPM-IMERG and ERA-Interim reanalysis daily time series over West of Iran. IMERG and ERA-Interim yield underestimate the observed values while IMERG underestimated slightly and performed better when precipitation is greater than 10mm. Furthermore, with respect to evaluation of probability of detection (POD), threat score (TS), false alarm ratio (FAR) and probability of false detection (POFD) IMERG yields a better value of POD, TS, FAR and POFD in comparison to era-Interim. Overall, ERA-Interim product produced fewer robust results when compared to IMERG.