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Comparative analysis of precipitation data from the Global Precipitation Measurement (GPM, NASA) mission and a national rain gauge network: three case studies in Italy

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The study presented here, is focused on a comparative analysis of the precipitation estimates produced by the new NASA mission, Global Precipitation Measurement (GPM) mission, and precipitation data from the Italian rain gauge network (managed by the Italian Civil Protection and provided by ARPA Emilia-Romagna) for three floods occurred in Italy between September and October 2015. In particular, among the different types of available GPM's products, the so called Integrated Multi-satellitE Retrievals for GPM (IMERG) data, which provides rainfall estimates combining data from all passive-microwave instruments in the GPM constellation, has been used. The satellite data is provided into half-hourly 0.1° x 0.1° fields, and, for the present study, an 18 hours latency (so called Near Real Time, Late Run) has been considered. The final goal of the study is to assess the reliability and the accuracy of GPM's precipitation estimates in order to use them as a hazard input for a Rapid Flood Loss Estimation methodology in countries were no precipitation data from a national (or local) rain gauge network is available. The analysis is aimed at comparing both the spatial distribution and statistical properties of the two above mentioned precipitation datasets.