



Ground validation of DPR precipitation rate over Italy using H-SAF validation methodology

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The H-SAF project (Satellite Application Facility on support to Operational Hydrology and Water Management, funded by EUMETSAT) is aimed at retrieving key hydrological parameters such as precipitation, soil moisture and snow cover. Within the H-SAF consortium, the Product Precipitation Validation Group (PPVG) evaluate the accuracy of instantaneous and accumulated precipitation products with respect to ground radar and rain gauge data adopting the same methodology (using a Unique Common Code) throughout Europe. The adopted validation methodology can be summarized by the following few steps: (1) ground data (radar and rain gauge) quality control; (2) spatial interpolation of rain gauge measurements; (3) up-scaling of radar data to satellite native grid; (4) temporal comparison of satellite and ground-based precipitation products; and (5) production and evaluation of continuous and multi-categorical statistical scores for long time series and case studies. The statistical scores are evaluated taking into account the satellite product native grid.

With the recent advent of the GPM era starting in march 2014, more new global precipitation products are available. The validation methodology developed in H-SAF can be easily applicable to different precipitation products. In this work, we have validated instantaneous precipitation data estimated from DPR (Dual-frequency Precipitation Radar) instrument onboard of the GPM-CO (Global Precipitation Measurement Core Observatory) satellite. In particular, we have analyzed the near surface and estimated precipitation fields collected in the 2A-Level for 3 different scans (NS, MS and HS). The Italian radar mosaic managed by the National Department of Civil Protection available operationally every 10 minutes is used as ground reference data.

The results obtained highlight the capability of the DPR to identify properly the precipitation areas with higher accuracy in estimating the stratiform precipitation (especially for the HS). An underestimation of the rainfall rate are observed in the retrieval of some convective case studies. The analysis of several (stratiform and convective) events occurred in the Mediterranean area in the last two years highlights the capability of the DPR to observe interesting features of the precipitation clouds and to estimate the ground rain intensity.