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Performances of GPM satellite precipitation over the two major Mediterranean islands

Domenico Caracciolo (1,2), Antonio Francipane (3), Francesco Viola (1), Roberto Deidda (1), and Leonardo Valerio Noto (3)

(1) Dipartimento di Ingegneria Civile, Ambientale e Architettura (DICAAR), Università di Cagliari, Cagliari, Italy, (2) Regional Environmental Protection Agency, Cagliari, Italy, (3) Dipartimento di Ingegneria Civile, Ambientale, Aereospaziale, e dei Materiali (DICAAM), Università di Palermo, Palermo, Italy.

Reliable and accurate precipitation measurement or estimation is crucial for disaster monitoring and water resource management. However, obtaining accurate high-resolution precipitation fields is still a challenging task for scientists and practitioners, especially in the poorer region of the world. Nowadays the scientific community expects significant improvements in precipitation monitoring by the continuous technological evolution of satellite-rainfall estimate systems which are able to produce data with global coverage and thus can provide low-cost information even in scarcely populated areas or places where for economic reasons ground measures are missing. The most recent satellite mission is the Global Precipitation Measurement (GPM), which is an international constellation of ten partner satellites, and a promising source of rainfall estimates at high spatial and temporal resolution.
In this context, the aim of this study is to assess the reliability of satellite-precipitation GPM products by evaluating to which extent these estimates are consistent with measured data. Our analysis is carried out using raingauges data in the two major islands of Mediterranean Sea, i.e. Sardinia and Sicily (Italy). Both are characterized by a complex morphology, and can be considered interesting test sites for satellite-precipitation GPM product in the European mid-latitude area. Indeed both islands experience different precipitation types, originated by stratiform and convective systems as well as by the interaction of steep orography in the coasts with winds carrying on humid air masses from the Mediterranean Sea. The GPM post real-time “Final” run product at 0.1° spatial resolution and half-hour temporal resolution has been selected for the two-year 2015-2016 period. Evaluation and comparison of the selected product are performed at hourly and daily time scale with reference to data provided by the raingauge networks of the two islands and by using statistical and graphical tools.