Precipitation estimation through satellite system over the major Mediterranean islands

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ABSTRACT

Reliable and accurate precipitation measurements and/or estimations are important to monitor and control disasters as well as to manage water resources. For these reasons, obtaining accurate precipitation has always been challenging for scientists and practitioners. The instruments currently adopted to measure precipitation are mainly ground point sensors (i.e., raingauges), ground areal sensors (i.e., weather radar), and satellite-based sensors. Among these, the satellite-rainfall estimate systems are able to retrieve data from large areas with a regular spatial coverage, thus can provide low-cost information even in those regions where other kinds of rainfall measurements are not available for several reasons (i.e., scarcely populated areas or underdeveloped economic countries). The Global Precipitation Measurement (GPM) is the most recent satellite mission; it is an international constellation of satellites including one Core Observatory satellite and approximately ten partner satellites. The extent to which these estimates are reliable depends on their fitting to measure data.

In this study we evaluate the performances of satellite-precipitation GPM products for different time and space scales in two target areas (Sardinia and Sicily, the two major islands of Italy), which are located in the Mediterranean Sea and are characterized by complex morphology, and thus can be considered as interesting test sites for European mid-latitude area. Different GPM products with the same spatial and time resolutions have been chosen for the analyses. Evaluations are performed for the 2015-2016 period by comparing GPM products with rainfall measurements provided by the raingauges network of the two Islands and by using statistical and graphical tools.