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On the use of raingauges data to validate satellite precipitation products

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In the last decade satellite precipitation estimation techniques have reached significant improvement in quantitative description of rainfall intensity and distribution over a wide range of spatial and temporal scales, and even higher performances are expected from the full exploitation of Global Precipitation Measurement Mission. Parallel to the development of new techniques the need of accurate and reliable ground reference fields is also growing, for both calibrating and validating satellite algorithms. The development of super sites, where a complete set of instruments for the measurement of precipitation characteristics and ancillary data are operated, can provide accurate data over the site area for algorithm calibration and physical validation. On the other side, the is still interest in comparing satellite estimates with data from ground networks of conventional instruments such as weather radars and raingauges, to operationally validate regional or global precipitation products. The comparison between satellite instantaneous areal estimate with the raingauge point-like time-cumulated measure poses different problems in the interpretation of the results of the matching. In particular, it is difficult to decide to what extent the difference between satellite estimate and ground measure is due to the real error and not to the different sampling of the two instruments.
In this work we address some aspects of the procedures commonly used for matching raingauge and satellite data, considering the use of different techniques to interpolate raingauge data and different approaches for data upscaling and downscaling. We make use of data from regional scale high resolution (1-minute sampling) raingauge networks to compute a number of commonly used skill indicators and to evaluate their sensitivity to the different matching strategies. The impact of parallax error in matching estimated and measured rain fields is also discussed.