STAHY2018-20
STAHY 2018 Workshop workshop,
24–26 September 2018, Adelaide, Australia

Performances of GPM satellite precipitation over the two major Mediterranean islands

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This study aims to assess the reliability of satellite-precipitation products from the Global Precipitation Measurements (GPM) mission in regions with complex landscape morphology. Our analysis is carried out in the European mid-latitude area, namely on the two major islands of Mediterranean Sea, i.e. Sardinia and Sicily (Italy). Both islands experience precipitation originating from the interaction of steep orography on the coasts with winds carrying humid air masses from the Mediterranean Sea. The GPM post real-time IMERG "Final" run product at 0.1° spatial resolution and half-hour temporal resolution have been selected for the two-year 2015–2016 period. Evaluation and comparison of the selected product, with reference to raingauge network data, are performed at hourly and daily time scales using statistical and graphical tools. The influences of morphology and land-sea coastal area transition on the reliability of the GPM product have been analysed.
Results showed that GPM satellite data slightly overestimate rainfall over the study areas. Metrics based on occurrences above a given threshold and on total volume above the same threshold were applied. Several drawbacks were detected in the coastal areas, which were characterized by worse performances than internal areas. Statistics are generally very similar for the two considered case studies.