



Classification of stratiform and convective precipitation over Athens area, Greece

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The objective of this paper is to classify the precipitation over Athens area to stratiform and convective components. The study area is characterized by complex topography and intense urbanization, while it is surrounded by water bodies such as Saronic Gulf at the south and Evoikos Gulf at the east. Athens basin experiences stratiform precipitation events exhibiting spatial and temporal variability, along with remarkable convective precipitation creating flash floods and consequently significant damages.

A methodology using evolutionary algorithms for best fitting the precipitation distribution has been developed based on 10 min precipitation time series from 12 meteorological stations, during 2009-2012. In addition, a critical rain intensity threshold has been determined for each meteorological station and year, in order to classify the precipitation into stratiform and convective components. Data from the Lightning Detection Network of Hellenic National Meteorological Service have been used to verify algorithm outputs with respect to convective precipitation. Furthermore, METAR reports and Tropical Rainfall Measuring Mission (TRMM) datasets have been implemented within the validation process.

The findings of the performed methodology indicate that the extracted classification of precipitation to stratiform and convective components is verified satisfactorily compared to the remote sensing and ground based independent observations.