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## Stochastic analysis of the spatial stochastic structure of precipitation in the island of Crete, Greece

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In the last few years, the island of Crete (Greece - Eastern Mediterranean) has been affected by extreme events. In recent decades, hydrometeorological processes in the island of Crete are monitored by an extensive network of meteorological stations. Here we stochastically analyze the spatial stochastic structure of precipitation in the island by employing sophisticated statistical tools, as well as by analyzing a large database of daily precipitation records. We investigate fifty-eight rainfall stations scattered in the four prefectures of Crete, for the years 1974-2020. Descriptive statistical analysis of precipitation examines several temporal properties in the data, while correlation analysis of precipitation variability provides relations between stations and regions for spatial patterns identification. This work also investigates the precipitation variability by employing statistical tools such as the autocorrelation, autoregressive (seasonal) analysis, probability distribution function fitting, and climacogram calculation, i.e. variance of the averaged process vs. spatial and temporal scales, to identify statistical properties, temporal dependencies, potential similarities in the dependence structure and marginal probability distribution.