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The Analysis of the Aftershock Sequence of the Recent Mainshock in Arkalochori, Crete Island Greece

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Forecasting the evolution of natural hazards is a critical problem in natural sciences. Earthquake forecasting is one such example and is a difficult task due to the complexity of the occurrence of earthquakes. Until today, earthquake prediction is based on the time before the occurrence of the main earthquake and is based mainly on empirical methods and specifically on the seismic history of a given area. The analysis and processing of its seismicity play a critical role in modern statistical seismology. In this work, a first attempt is made to study and draw safe conclusions regarding the prediction for the seismic sequence, specifically using appropriate statistical methods like Bayesian predictive, taking into account the uncertainties of the model parameters. The above theory was applied in the recent seismic sequence in the area of Arkalochori in Crete Island, Greece (2021, M_w 6.0). The rich seismic sequence that took place immediately after the main 5.6R earthquake with a total of events for the next three months, approximately 4,000 events of magnitude $M_L > 1$ allowed calculating the probability of having the most significant expected earthquake during a given time as well as calculating the probability that the most significant aftershock is expected to be above a certain magnitude after a major earthquake.

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