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Earthquake Clustering Features Inferred from the Mean Proprieties of Interevent Times and Distances

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Interevent times between successive earthquakes are studied in space and time using data from Japan and southern California. The main objective is to depict general non-subjective clustering characteristics of interevent times that can be used to isolate clusters in observed seismicity. First, different declustering algorithms are applied to original data to estimate the residual background interevent time distribution. Then, clustering degree is measured using the distance between the obtained residual distribution and the whole distribution from the original data. Finally, the former analysis is carried out for different magnitude cutoffs and different time periods to take into account the completeness of magnitudes.

The preliminary results show that earthquake process is dominated by short and long term clustering. In contrast, the so-called background process occurs mainly at intermediate times. The same study applies to interevent distances and shows quite similar behavior in space.

The former analysis describes seismicity as the accumulation of local perturbations related to a unique mean field background processes characterized by the mean interevent time and the mean interevent distance. It highlights the importance of mean space-time proprieties in the estimation of objective and data inferred association measures between earthquake events. This study provides fundamental key tools for the elaboration of stochastic declustering strategies.

キーワード: Interevent times, Earthquake clustering, Background seismicity, Association measure
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