EGU2020-4788
https://doi.org/10.5194/egusphere-egu2020-4788
EGU General Assembly 2020

A study of earthquake clustering in central Ionian Islands through a Markovian Arrival Process

Polyzois Bountzis, Tasos Kostoglou, Vasilios Karakostas, and Eleftheria Papadimitriou
Geophysics Department, School of Geology, Aristotle University of Thessaloniki, Thessaloniki, Greece
(pmpountzp@geo.auth.gr)

Earthquake clustering investigation reveals characteristics of the earthquake dynamics, like the evolution of main shock-aftershock sequences and swarms. For such investigation we applied a method based on a bivariate stochastic point process, the Markovian arrival process (MAP) [Neuts, 1979], $(N_t J_t)t\square\square^+$, whose intensity function, λ_t, is modulated by a latent Markov process, J_t. Each hidden state corresponds to a distinct seismicity rate of the counting process, N_t, enabling the modeling of the fluctuations between triggered and background seismicity, as well as clustering evolution. We assume that the physical mechanisms governing earthquake clustering are unknown and the prevailing parameter to separate the background seismicity from seismic excitations is the seismicity rate. The consistency of the identified clusters is evaluated on the seismicity of the area of central Ionian, comprising Lefkada and Kefalonia Islands. This is an active boundary characterized by remarkably high seismic activity, with frequent strong mainshocks (M≥6.0) and a dense monitoring network. The method is applied on a recent highly accurate relocated earthquake catalog with a low completeness magnitude as well as to an earthquake catalog of longer time duration, from 2008 to 2017, including well studied and very productive aftershock sequences.

Acknowledgments

This research is co-financed by Greece and the European Union (European Social Fund- ESF) through the Operational Programme «Human Resources Development, Education and Lifelong Learning 2014-2020» in the context of the project “Kinematic properties, active deformation and stochastic modelling of seismogenesis at the Kefalonia - Lefkada transform zone” (MIS-5047845).