

Study of the seismic activity in central Ionian Islands via semi-Markov modelling

Christina E. PERTSINIDOU^{1,3,✉}, George TSAKLIDIS¹,
and Eleftheria PAPADIMITRIOU²

¹Department of Mathematics, Aristotle University of Thessaloniki,
Thessaloniki, Greece

²Department of Geophysics, Aristotle University of Thessaloniki,
Thessaloniki, Greece

³Université de Technologie de Compiègne, Sorbonne Universités,
LMAC Laboratoire de Mathématiques Appliquées de Compiègne,
Compiègne, France

✉ p.eli.christina@gmail.com

A b s t r a c t

The seismicity of the central Ionian Islands ($M \geq 5.2$, 1911–2014) is studied via a semi-Markov chain which is investigated in terms of the destination probabilities (occurrence probabilities). The interevent times are considered to follow geometric (in which case the semi-Markov model reduces to a Markov model) or Pareto distributions. The study of the destination probabilities is useful for forecasting purposes because they can provide the more probable earthquake magnitude and occurrence time. Using the first half of the data sample for the estimation procedure and the other half for forecasting purposes it is found that the time windows obtained by the destination probabilities include 72.9% of the observed earthquake occurrence times (for all magnitudes) and 71.4% for the larger ($M \geq 6.0$) ones.

Key words: semi-Markov model, destination probabilities, entrance probabilities, seismic hazard assessment.

Full text is available at

<https://link.springer.com/article/10.1007/s11600-017-0040-y>