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Predictability of seismic energy rate in northwest frame of Pacific Ocean on the base of USGS catalogue

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Abstract

The results of predictability assessment for seismic energy rate and strong earthquakes have been presented. Data of USGS seismic catalog have been used. The nonlinear differential equation of the second order is used as a mathematical model, and algorithms of optimization and assessment of predictability are presented by author's developments. The executed estimates show high predictability of seismic energy rate. Predictability has been revealed for 112 earthquakes from 274 analyzed strong earthquakes (the total number of definitions is nearly 2000). Aftershock predictability has been revealed for 242 strong earthquakes from those 274 events (~34 thousand aftershocks definitions). The predictability related to strong earthquakes arises in the circular zone of average radius of about 7.5–30 of the hypocenters sampling. The predictability improves (the number of predicted events grows) with increase in sampling radius. Expected temporal distances is of order of several tens days for foreshock predictions and thousands days – for aftershock predictions. The obtained results show very good prospects of approximation extrapolation approach for the predictions of both: strong earthquakes, and the subsequent attenuation of seismic activity.

Keywords

Earthquake, Energy, Modeling, Prediction

References

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