



Applying Error Diagram for Evaluating Spatial Forecasting Model of Large Aftershocks

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Difficulty of use in practice the forecasting result formulated in probability terms is well known in statistical seismology. Small values of probability of earthquake occurrence cannot be directly used for decision making to reduce losses due to seismic hazard. In this research we suggest a technique for applying Molchan's error diagram to evaluate a model of seismic hazard forecasting and make practical recommendation, applied specifically to the hazard after large earthquakes. We illustrate the suggested technique by example of evaluating retrospective forecast of an area where one can expect strong aftershock ($M6+$). The forecast model is based on data for 12 hours after the mainshock. We found an optimal variant among many tested by minimizing the rate of missed targets (strong aftershock) and the rate of alarm space as a loss function. Analyzing the error diagram, we suggest these three forecast strategies: "soft", "neutral", and "hard", giving different size of the alarm area, where one may expect strong aftershocks. The suggested technique can be used for making decision at various conditions to reduce losses due to seismic hazard after a strong earthquake.

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