

Earthquake Probabilities Based on Changes in b-value and Potential Foreshocks with a Statistical Consideration

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We attempted to construct a model for probabilities of intermediate-size earthquakes in the Kanto region based on two parameters, changes in b-value and numbers of potential foreshocks. The model's learning space-time volume is from 1982 to 1999 in a $160 \times 160 \times 80 \text{ km}^3$ volume. Sixteen target events with magnitude larger than 5.5 occurred within this volume. Early studies report maximum probability gains of 4 and 16 for the models of b-value and potential foreshocks. Assuming independence between the parameters, we could obtain a maximum probability gain of 64. To examine this assumption, we calculated samples of simultaneous observation of the two parameters in the background. As the result, we found that a distribution which fits these samples was approximated by the product of the distribution of the b-value model and that of the potential foreshock. This supported the independence of the parameters.