

Earthquake probabilities based on multidisciplinary anomalies with correlations (2)

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Utsu, Aki and others have formulated earthquake probabilities based on precursory anomalies of multi-disciplinary observation. We assume that observed values of each discipline follow a normal distribution either for a period followed by an earthquake (conditional density distribution) or a period not followed by an earthquake (background density distribution). We consider two cases, the case in which two kinds of observations are correlated in the conditional density distribution but not in the background density distribution, and the case in which two kinds of observations are correlated in the background density distribution but not in the conditional density distribution. In the former case, the geometrical mean of probability gain is larger in the correlated case than in the independent case and becomes infinitely large when the absolute value of the correlation coefficient approaches 1. In the second case, the geometrical mean is not necessarily larger in the correlated case than in the independent case.