

Statistical causal relationship between earthquake occurrences and the ultra-low frequency ground electric signals

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This paper investigates the causal relationship between the earthquake occurrences and the observed amplitudes of the ultra-low frequency ground electric field which are recorded at 4 stations around the Beijing region. We model the occurrence rate change of the earthquakes of M4.0 or larger as a function of the time series of amplitudes of the electric signals. This model is successfully applied to test the precursory data by using the AIC. Furthermore, we construct the hazard rate functions of time for the common neighboring areas from the 3 or 4 stations using the Multiple Prediction Formula. It is seen that these hazard functions predict much better than each of the hazard functions based on a single station only.

This paper investigates the causal relationship between the earthquake occurrences and the observed amplitudes of the ultra-low frequency ground electric field which are recorded at 4 stations around the Beijing region, China (Guan and Liu, 1995). We model the occurrence rate change of the earthquakes of M4.0 or larger as a function of the time series of amplitudes of the electric signals by extending the point-process model discussed by Ogata et al (1982). This model is successfully applied to test the precursory data by using the Akaike's Information Criterion. Furthermore, we construct the hazard rate functions of time for the common neighboring areas from the 3 or 4 stations using the Multiple Prediction Formula (Utsu, 1977; Aki, 1981). It is seen that these hazard functions predict much better than each of the hazard functions based on a single station only.

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