

Precursory seismicity change of the 1999 Chi-Chi, Taiwan earthquake revealed by the ETAS model

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In order to investigate the preparatory process of the 1999 Chi-Chi, Taiwan earthquake and the statistical feature of its related seismicity, we applied the Epidemic-Type Aftershock-Sequences model (ETAS model) (Ogata, 1988) to the earthquake data in Taiwan region. By means of the ETAS analysis for Taiwanese earthquakes with magnitudes larger than 2.4, seismic quiescence was found over broader regions of Taiwan, while seismic activation was identified near the source areas of the Chi-Chi earthquake in the period from Jan. 1, 1998 to Sep. 20, 1999, which is just before the occurrence of the Chi-Chi earthquake. The assumption that this is due to precursory slip (stress drop) on the fault plane of the Chi-Chi earthquake is supported by previous researches such as a numerical simulation using rate- and state-dependent friction laws (Kato et al., 1997) and the observation of abnormal change in crustal displacement for a station of Taiwan GPS network near southern edge of the source area of the Chi-Chi earthquake (Hou et al., 2003).

Reference

Kawamura, M. and C.-c. Chen, Precursory change in seismicity revealed by the Epidemic-Type Aftershock-Sequences model: A case study of the 1999 Chi-Chi, Taiwan earthquake, *Tectonophysics*, accepted.

Keywords: ETAS model, seismic quiescence, seismic activation, seismic activity, precursory slip, the 1999 Chi-Chi earthquake