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Study and comparison of various parameters to individuate seismic anomalies: application to an aftershock sequence

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Studying a wide spectrum of parameters can be very useful in detecting seismic anomalies preceding strong earthquakes. This work was focused on the analysis of Taiwan seismic sequence (20 Sept 1999) by means of some parameters that showed remarkable variations during the aftershock decay.

To carry out the analysis we first used selection criteria on data coming from NEIC-USGS database. A magnitude threshold $M_{th} = M_c$=4.2 was estimated, where M_c represents the magnitude of completeness obtained by Gutenberg-Richter relation (1954).

Seismic decay fits a power law like the modified Omori formula (Utsu, 1961) and ends 80 days after the mainshock. This decay is clearly related to p-value. In particular, we find the anomalies estimating the ratios of the differences between the observed temporal trend and the calculated trend, and the standard deviations of the calculated trend (D'Amico et al. 2004).

We also analysed the b-value variations, the cumulative energy of the sequence shocks, the temporal decay of events with a magnitude $M >$5.5, and the fractal behaviour of aftershocks temporal series.