

Deviation from power law of the global seismic moment distribution

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Abstract

The distribution of seismic moment is of capital interest to evaluate earthquake hazard, in particular regarding the most extreme events. We make use of likelihood-ratio tests to compare the simple Gutenberg-Richter power-law (PL) distribution with two statistical models that incorporate an exponential tail, the so-called tapered Gutenberg-Richter (Tap) and the truncated gamma, when fitted to the global CMT earthquake catalog. Although the Tap distribution does not introduce any significant improvement of t respect the PL, the truncated gamma does. Simulated samples of this distribution, with parameters $\beta = 0.68$ and $m_c = 9.15$ and reshuffled in order to mimic the time occurrence of the order statistics of the empirical data, are able to explain the temporal heterogeneity of global seismicity both before and after the great Sumatra-Andaman earthquake of 2004.