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Some insights on the nonrandom patterns in the occurrence of worldwide strong earthquakes

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The purpose of our work is to detect significant rate changes in occurrence history of middle-strong shocks, both on global scale as into tectonically homogeneous zones.

The stochastic modeling of occurrence times provides basic information in identifying features of the seismogenetic process. We analyze data from two worldwide catalogs in order to find "universal" relationships linked to different time period and magnitude thresholds. In particular, by some statistical measures, we test the *null hypothesis* of a stationary Poisson process, in the time domain, for *background activity*. To this we ascribe meaning that primary events have in a branching process. Our findings suggests that the paradigm that seismic zones are stationary systems, implicitly assumed in seismic hazard assessment too, should be regarded with caution.