



Earthquake sequences: Predictive understanding versus complex reality

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Regular features of discrete cascades of fractures are generally observed both in Nature and laboratory. The observed seismic dynamics prior to and after many mega, great, major, and strong earthquakes demonstrate common features of predictability and diverse behavior in course durable phase transitions in complex hierarchical non-linear system of blocks-and-faults of the Earth lithosphere. The confirmed fractal nature of earthquakes and their distribution in space and time implies that traditional estimations of seismic hazard are usually based on erroneous assumptions of simple analytically tractable models. Understanding the complexity of seismic process along with its non-stationary though self-organized behaviors, has led already to reproducible intermediate-term middle-range earthquake prediction technique that has passed control test in forward real-time applications during at least the last two decades. To facilitate the understanding, many cases from the recent seismic history are presented to evidence common features and complexities of earthquake sequences.