



Earthquake recurrence as a record breaking process

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Extending the central concept of recurrence times for a point process to recurrent events in space-time allows us to characterize seismicity and its dynamics from a truly spatiotemporal and network perspective. For Southern California, this approach captures non-trivial features of seismicity and exhibits robust scaling laws. In particular, the rupture length and its scaling with magnitude emerges as a fundamental scale for distance between recurrent events. Also, the distribution of relative separations for the next recurrence in space (time) $\sim r^{-\delta_r}$ ($\sim t^{-\delta_t}$), with $\delta_r \approx \delta_t \approx 0.6$ having direct implications for seismic hazard assessment.