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Dependent earthquake recurrence times and independent magnitudes

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Does an earthquake know how large it will become? And does it know when it will strike? Analysis of worldwide and Southern California seismicity shows that the answer to the first question is clearly no: the magnitude of an earthquake is totally uncorrelated with the time of previous events and also with the magnitude of those events (at least for time scales larger than about 30 min). In contrast, the time between two consecutive events does depend on the magnitude of the former event, as well as on the times of previous events, in such a way that the larger the magnitude, the shorter the recurrence time, and the shorter the recurrence time, the shorter the next recurrence times. Correlations between recurrence times and distances are also studied, and relations with self-organized criticality discussed.