



Search for signatures that imply the transition to earthquake nucleation by means of complexity

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An important organization of a physical system precedes a catastrophic event. In this context, one can search for signatures that imply the transition to a catastrophic event, e.g., earthquake. Recent results indicate that pre-seismic MHz-kHz electromagnetic time series contain information characteristic of an ensuing earthquake event. Hereby, we attempt to demonstrate that complexity measures give evidence of state changes leading to the point of global instability. Our results suggest an important principle: significant complexity decrease and accession of persistency in electromagnetic EM time series can be confirmed at the tail of the preseismic EM activity, which could be used as diagnostic tools for the Earth's impending crust failure. Direct laboratory and field experimental data as well as theoretical arguments support the conclusions of the present analysis.

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