

Self-organized Criticality in an Earthquake Model on Random Network

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Abstract: A simplified Olami-Feder-Christensen model on a random network has been studied. We propose a new toppling rule — when there is an unstable site toppling, the energy of the site is redistributed to its nearest neighbors randomly not averagely. The simulation results indicate that the model displays self-organized criticality when the system is conservative, and the avalanche size probability distribution of the system obeys finite size scaling. When the system is nonconservative, the model does not display scaling behavior. Simulation results of our model with different nearest neighbors q is also compared, which indicates that the spatial topology does not alter the critical behavior of the system.

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Key words: self-organized criticality, earthquake model, finite size scaling, random network

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