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A local-world evolving network model. (English) Zbl 1029.90502

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Summary: We propose and study a novel evolving network model with the new concept of local-world connectivity, which exists in many physical complex networks. The local-world evolving network model represents a transition between power-law and exponential scaling, while the Barabási-Albert scale-free model is only one of its special (limiting) cases. We found that this local-world evolving network model can maintain the robustness of scale-free networks and can improve the network reliance against intentional attacks, which is the inherent fragility of most scale-free networks.

MSC:

90B10 Deterministic network models in operations research
68U35 Computing methodologies for information systems (hypertext navigation, interfaces, decision support, etc.)
82C20 Dynamic lattice systems (kinetic Ising, etc.) and systems on graphs in time-dependent statistical mechanics

Keywords:

connectivity; scaling; intentional-attack reliance

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