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**A Self-organized model for network evolution** GUIDO CALDARELLI, CNR-INFM Centre SMC Dip. Fisica, University “Sapienza” Rome, Italy, ANDREA CAPOCCI, Dip. Fisica Universita’ “Sapienza” Rome, Italy, DIEGO GARLASCHELLI, Dipartimento di Fisica, Universita’ di Siena, Italy — Here we present a self-organized model for the evolution of complex networks. Vertices of the network are characterized by a variable evolving through an extremal dynamics process. The network topology is in turn shaped by the variable itself. More specifically, to each vertex a fitness is assigned; then, in the evolution, the vertex with minimum fitness and its neighbors are updated by extracting new fitnesses. For any given realization of fitnesses we can determine the edges in the network through a fitness dependent rule. We show analytically and numerically that this system self-organizes to a nontrivial state. A power-law decay of dynamical and topological quantities above a threshold emerges spontaneously, as well as a feedback between different dynamical regimes and the underlying network’s correlation and percolation properties.

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