

Cooperative hierarchical structures emerging in multiadaptive games

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We investigate a game-theoretic model of a social system where both the rules of the game and the interaction structure are shaped by the behavior of the agents. We call this type of model, with several types of feedback couplings from the behavior of the agents to their environment, a multiadaptive game. Our model has a complex behavior with several regimes of different dynamic behavior accompanied by different network topological properties. Some of these regimes are characterized by heterogeneous, hierarchical interaction networks, where cooperation and network topology coemerge from the dynamics. †

† S. Lee, P. Holme, and Z.-X. Wu, Phys. Rev. Lett. **106**, 028702 (2011); Phys. Rev. E **84**, 061148 (2011).