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COMMUNITY DETECTION IN A SOCIODYNAMIC MODEL OF CONFLICT

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We develop an agent-based model for the formation of structures (coalitions or clusters) in social dynamics. Rules of interactions between agents are inspired by the mechanism of "pay-or-else", which is typical in the dynamics of social conflicts and power relations. The transfer of resources between agents determines evolving compromises between them, which are characterized through a connectivity matrix. Thus, the states of the agents coevolve with their connectivity, allowing the formation of clusters of strongly coupled elements that are interpreted as coalitions. The topological properties of the resulting structures are characterized. Similarly, the statistical dynamical properties of the model are investigated. We find power law behaviors in the probability distributions of sizes of conflicts and of their duration, and intervals of inactivity or peace. These results agree with the historical data on conflicts and with the statistical behavior observed in other non-equilibrium physical systems.

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