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Cooperative SIS epidemics can lead to abrupt outbreaks FAKHTEH GHANBARNEJAD, Max Planck Institute for the Physics of Complex Systems, Germany, LI CHEN, Robert Koch-Institute, 13353 Berlin, Germany, WEIRAN CAI, Technische Universität Dresden, Germany, PETER GRASSBERGER, Forschungszentrum Jülich, Germany — In this paper, we study spreading of two cooperative SIS epidemics in mean field approximations and also within an agent based framework. Therefore we investigate dynamics on different topologies like Erdos-Renyi networks and regular lattices. We show that cooperativity of two diseases can lead to strongly first order outbreaks, while the dynamics still might present some scaling laws typical for second order phase transitions. We argue how topological network features might be related to this interesting hybrid behaviors.

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