

THRESHOLDS, LOCALIZATION AND CENTRALITY IN EPIDEMIC SPREADING ON NETWORKS

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Spreading phenomena are ubiquitous in our increasingly interconnected world. In the investigation of these phenomena, simple models for disease transmission play a paradigmatic role. The effect of topologically complex interaction patterns on them has attracted a huge interest in the last years. In this talk, I will focus on the behavior of the Susceptible-Infected-Susceptible (SIS) model for infections without acquired immunity, discussing how its theoretical understanding has grown over the years, with increasingly more refined approaches, uncovering a surprisingly rich phenomenology. The emerging picture is that the epidemic transition is triggered by different physical mechanisms, associated to distinct subgraphs playing the role of infection activators. This interpretation, purely based on the spreading dynamics, allows at the same time to throw light on the closely related issue of the nontrivial localization properties of different centrality measures on networks.