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Cascades of overload failures in spatial networks[1] ANDREA ASZTALOS, SAMEET SREENIVASAN, BOLESLAW SZYMANSKI, GYORGY KORNISS, Rensselaer Polytechnic Institute — Our daily life imposes increasing demands on infrastructural networks such as the power grid, transportation network, water supply, etc. Understanding the vulnerabilities of these systems is crucial to securing them. To this end, we study the effect of spatial constraints on network resilience against cascading overloads. Specifically, we consider distributed and shortest path flows on spatially embedded networks and study the model of cascading failures (Motter and Lai (2002)) triggered by the removal of a single or multiple nodes. We present results of intentional attacks on highly loaded and high degree nodes as well as a comparison between spatially concentrated and randomly distributed, multiple attacks.

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