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Percolation of Double-Layer Networks with Different Topologies Under Random Attacks DI ZHOU, JIANXI GAO, Center for Polymer Studies and Department of Physics, Boston University, SHLOMO HAVLIN, Mineva Center and Department of Physics, Bar-Ilan University, H.EUGENE STANLEY, Center for Polymer Studies and Department of Physics, Boston University — We report on the effects of topology on failure propagation models for systems consisting of two interdependent networks, which are either SF networks with different parameters, or different types of networks. Pairs of interdependent networks are known to exhibit a percolation transition upon failure accumulation. The topology of the nets significantly change the critical density of failure for the total disruption of the two net composite system. When the system is not fully coupled, the existence of a very small fraction of SF network will hold the system from fragment. When the critical threshold p_c doesn't change, robustness measure R is introduced. The consequences of the study may provide insights for future network architectures and their evolution to improve their robustness and enhancing the protection of critical infrastructure.

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