

Abstract Submitted
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Multiplexity-facilitated cascade dynamics in networks KYU-MIN LEE, Department of Physics and Institute of Basic Science, Korea University, CHARLES BRUMMITT, Department of Mathematics and Complexity Sciences Center, University of California, Davis, KWANG-IL GOH, Department of Physics and Institute of Basic Science, Korea University — Most complex network studies thus far have been focused on single-layer framework. It becomes increasingly clear, however, that many real-world complex systems are *multiplex*—nodes interact with multiple types of interactions (links) which coexist, co-depend, and co-evolve. The interplay of such multiplex interactions may confer nontrivial consequences on network dynamics. Here we present recent results on how such multiplexity affects cascade dynamics on networks. We found the cascade progression is greatly facilitated by multiplexity. Layers that are unable to achieve global cascades in isolation can cooperatively achieve them by multiplex coupling. Therefore, the multiplex network can be dramatically more vulnerable to global cascades than single-layer or simplex networks. Implication of these results on cascade prediction and control in social and economic dynamics is also discussed.

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