

Abstract Submitted
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Rare Event Extinction on Stochastic Networks¹ IRA SCHWARTZ²,
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LINDLEY, R. D. Wagner Associates, Inc. — We consider the problem of extinction
processes on random networks with a given structure. For sufficiently large
well-mixed populations, the process of extinction of one or more state variable
components occurs in the tail of the quasi-stationary probability distribution, thereby
making it a rare event. Here we show how to extend the theory of large deviations
to random networks to predict extinction times. In particular, we use the theory to
find the most probable path leading to extinction. We apply the methodology to
epidemic models and discover how mean extinction times scale with epidemiological
and network parameters in Erdos-Renyi networks. The results are shown to compare
quite well with Monte Carlo simulations of the network in predicting both the most
probable paths to extinction and mean extinction times.

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²Nonlinear Systems Dynamics Section

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