

# Adaptive networks: Coevolution of disease and topology

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## Abstract

Adaptive networks have been recently introduced in the context of disease propagation on complex networks. They account for the mutual interaction between the network topology and the states of the nodes. Until now, existing models have been analyzed using low-complexity analytic formalisms, revealing nevertheless some novel dynamical features. However, current methods have failed to reproduce with accuracy the simultaneous time evolution of the disease and the underlying network topology. In the framework of the adaptive SIS model of Gross *et al.* (PRL 96, 208701, 2006), we have developed an improved compartmental formalism able to handle this coevolutionary task successfully. This new approach will allow us to quantify the interplay and outcomes of both dynamical elements, process versus structure. We will present representative results of our studies on adaptive networks with various degrees of heterogeneity.