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Michael Robinson*, 4400 Massachusetts Ave NW, Washington, DC 20016. *Sheaf-based communication network invariants.*

Communication networks are constrained by the capacity of their associated channels. Network performance degrades when channel capacity is reached in portions of the network. Capacity depends on many different parameters, not all of which are easy to measure or model. For instance, network protocols and traffic conditions can have a significant effect on network capacity. Since protocols are localized to individual nodes or links in a network, the mathematics of sheaves can be used to represent both capacity constraints and network protocols. This talk will connect the theory of sheaves to high-fidelity simulated models of networks, and demonstrate the effectiveness of sheaf-based algorithms under realistic network conditions. (Received July 27, 2015)