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**Miaohua Jiang\*** ([jiangm@wfu.edu](mailto:jiangm@wfu.edu)), PO BOX 7388, Wake Forest University, Department of Mathematics, Winston Salem, NC 27109. *A deterministic contact network model of epidemics*. Preliminary report.

We introduce a simple SIS epidemic model over an arbitrary static contact network. The basic reproductive number of the model is represented by the logarithm of the topological pressure of a potential function in terms of transmission and recovery probabilities. This simple model allows us to study the dependence of the basic reproduction number on the topology of the network, the transmission probabilities between any two individuals, as well as the recovery probability of any individual in the network. (Received July 14, 2011)