

Stochastic networks consisting of a set of finite capacity sites where different classes of individuals move according to some routing policy are considered. The associated Markov jump processes are analyzed under a thermodynamic limit regime, i.e. when the network has some symmetry properties and when the number of nodes goes to infinity. An unusual property for stochastic networks, metastability, is proved: under some conditions on the parameters, it is shown that, in the limit, several equilibrium points coexist for the empirical distribution. The proof of this property uses a dimension reduction achieved by the introduction of two energy functions and a convenient mapping of their local minima and saddle points. The impact of this property is discussed. Cases with a unique equilibrium point are also presented.

Joint work with Antunes, Fricker and Tibi.