

Asymptotics for sparse exponential random graph models

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We study the asymptotics for undirected sparse exponential random graph models where the parameters may depend on the number of vertices of the graph. We obtain a variational principle for the limiting free energy, an associated concentration of measure, the mean and variance of the limiting probability distribution, and phase transitions in the edge-(single)-star and edge-triangle models. Similar analysis is done for directed sparse exponential random graph models parametrized by edges and multiple outward stars. Joint work with Lingjiong Zhu.