CONNECTIVITY OF STOCHASTIC KRONECKER GRAPHS

STEPHEN J. YOUNG
UNIVERSITY OF LOUISVILLE

Abstract. Stochastic Kronecker graphs are a model for complex networks where each edge is present independently according the Kronecker (tensor) product of a fixed matrix $P \in [0,1]^{k \times k}$. We develop a novel correspondence between the adjacencies in a general stochastic Kronecker graph and the action of a fixed Markov chain. Using this correspondence we are able to generalize the arguments of Horn and Radcliffe on the emergence of the giant component from the case where $k = 2$ to arbitrary k. We are also able to use this correspondence to completely analyze the connectivity of a general stochastic Kronecker graph. Joint work with Mary Radcliffe.