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Spectral recovery of stochastic block models on graphs and hypergraphs

The stochastic block model is a random graph model in which n fixed vertices are partitioned into k clusters, and edges are added independently between each pair of verices with probability p if they are in the same cluster and q if they are in different clusters, where $0 \leq q < p \leq 1$. Given only a random graph from this distribution, can one recover the partition of the vertices w.h.p? We will discuss a simple algorithm that accomplishes this using spectral properties of the random graph's adjacency matrix, and a generalization to a hypergraph setting. While there have been many results for the sparse case, in which $p, q = o(1)$ and the number of clusters k is fixed, we will focus on the dense case, in which p, q are fixed and k grows with n.