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Stationary vectors of stochastic matrices subject to combinatorial constraints

Given a strongly connected directed graph D , let SD denote the set of all stochastic matrices whose directed graph is a spanning subgraph of D . Can we describe the set of stationary vectors of irreducible members of SD ? We will use results from the area of convex polytopes and an association of each matrix with an undirected bipartite graph to tackle this question, and discuss applications of this to the area of Markov chains, as well as some more unusual applications. This talk is based on joint work with Steve Kirkland.