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Stochastic matrices and the boundary of the Karpelevich region

A square nonnegative matrix with all row sums equal to 1 is known as a stochastic matrix, and the eigenvalues of such matrices are central to the study of Markov chains. Given a natural number n , the corresponding Karpelevich region is the subset of the complex plane consisting of all eigenvalues arising from stochastic matrices of order n . In this talk we report on some recent progress on the problem of characterizing the stochastic matrices having a complex eigenvalue on the boundary of the corresponding Karpelevich region. Joint work with Helena Smigoc and Priyanka Joshi.