

Abstract

The Kadison-Singer problem

In 1959, R.V. Kadison and I.M. Singer asked whether each pure state of the algebra of bounded diagonal operators on ℓ^2 admits a unique state extension to $B(\ell^2)$. The positive answer was given in June 2013 by A. Marcus, D. Spielman and N. Srivastava, who took advantage of a series of translations of the original question, due to C. Akemann, J. Anderson, P. Casazza, N. Weaver, . . . Ultimately, the problem boils down to an estimate of the largest zero of the expected characteristic polynomial of the sum of independent random variables taking values in rank-one positive matrices in the algebra of n -by- n matrices. In turn, this is proved by studying a special class of polynomials in d variables, the so-called real stable polynomials. The talk will highlight the main steps in the proof, which interestingly is accessible to an undergraduate student.