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Circular Free Spectrahedra

Abstract

This talk considers matrix convex sets invariant under several types of rotations. It is known that matrix convex sets that are free semialgebraic are solution sets of Linear Matrix Inequalities (LMIs); they are called free spectrahedra. The talk will classify all free spectrahedra that are circular, that is, closed under multiplication by e^{it}: up to unitary equivalence, the coefficients of a minimal LMI defining a circular free spectrahedron have a common block decomposition in which the only nonzero blocks are on the superdiagonal.

This talk also gives a classification of those noncommutative polynomials invariant under conjugating each coordinate by a different unitary matrix. Up to unitary equivalence such a polynomial must be a direct sum of univariate polynomials. This talk is based on joint work with Bill Helton, Igor Klep, and Scott McCullough.

Talk time: 07/22/2016 3:30PM— 07/22/2016 3:50PM
Talk location: Crow 206

Special Session: Non-commutative inequalities. Organized by J.W. Helton and I. Klep.