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Correlation Matrices in Quantum Information Theory

Correlation matrices are positive semidefinite matrices which have all of their diagonal entries equal to one. In this talk, we explore some applications of correlation matrices to topics in quantum information such as quantum channels, coherence and Bell's inequalities. The key common mathematical theme between all of these topics is the interplay between the set of correlation matrices and the subset formed by taking the convex hull of the rank-one correlation matrices.