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Quantum correlations and optimization

Entanglement is one of the key features of quantum mechanics, e.g., creating (bipartite) correlations which cannot be obtained classically. There are basically two mathematical models to describe bipartite quantum correlations: via commuting operators and via tensor products of operators. We will present conic descriptions of these sets, which allows a broader use of (real) algebraic methods for a better understanding of quantum correlations. We will discuss some of these approaches mostly related to approximation methods from conic or polynomial optimization.