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" Moments in quantum information theory "

Abstract:

Due to the phenomenon of entanglement quantum correlations are more powerful than classical correlations. One way to investigate those correlations is to compute quantum versions of graph parameters or the so-called values of a quantum game. These numbers are hard to compute but might be approximated using non-commutative optimization and non-commutative moment theory. There are basically two models for quantum correlations: the spatial model and the commuting model, using either spatial tensor products of operators, or respectively products of commuting operators, to generate correlations. Each model leads to a different type of non-commutative moment problems related to trace-optimization or eigenvalue-optimization. After a short introduction into quantum correlations and quantum games we will give an overview of the current status of the different moment problems showing up.