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Title: Infinite Dimensional Quantum Strassen Theorem

Abstract: Strassen's theorem circa 1965 gives necessary and sufficient conditions on the existence of a probability measure on two product spaces with given support and two marginals. In the case where each product space is finite Strassen's theorem is reduced to a linear programming problem which can be solved using flow theory. A density matrix of bipartite quantum system is a quantum analog of a probability matrix on two finite product spaces. Partial traces of the density matrix are analogs of marginals. The support of the density matrix is its range. The analog of Strassen's theorem in this case can be stated and solved using semidefinite programming. The aim of this paper is to give analogs of Strassen's theorem to density trace class operators on a product of two separable Hilbert spaces, where at least one of the Hilbert spaces is infinite dimensional.

Joint work with Shmuel Friedland and Jingtong Ge