

QUANTUM HYPERGRAPH HOMOMORPHISMS AND APPLICATIONS TO NON-LOCAL GAMES

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Utilizing the simulation paradigm in information theory, we introduce notions of quantum hypergraph homomorphisms and quantum hypergraph isomorphisms by considering different no-signalling correlation classes and the hypergraphs the associated information channels induce. We provide examples of separation between classical and quantum hypergraph isomorphism. For a given hypergraph isomorphism game, we show that the existence of perfect no-signalling (resp. quantum commuting, quantum approximate) strategies can be characterized in terms of states on tensor products of canonical operator systems. We further focus on a subclass of hypergraph homomorphism games where the hypergraphs are themselves non-local games. We define strongly no-signalling correlations and their various subtypes, and investigate game strategy transport and the existence of perfect strategies for games using an operator system approach.

The talk will be based on a joint work with Ivan G. Todorov.

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