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Irreducibly SU(2)-covariant quantum channels

Quantum channel is one of the most fundamental objects in quantum information theory, and group symmetry has been considered important resources to analyze quantum channels. Conservation of irreducible group symmetries has been studied for quantum channels in various contexts. In particular, geometric structures of the set of all irreducibly covariant quantum channels have been clarified very recently. The main aim of this talk is to present detailed information-theoretic properties of irreducibly SU(2)-covariant quantum channels of low rank (less than or equal to 3). For example, we present complete characterizations of PPT property, entanglement-breaking property, degradability, Holevo information in this class. Moreover, this approach gives us a new example of additivity violation of the coherent information.