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A fidelity measure for quantum strategies

We introduce a definition of the fidelity function for multi-round quantum strategies, called the strategy fidelity, which is a generalization of the fidelity function for quantum states. We provide many interesting properties of the strategy fidelity including a Fuchs-van de Graaf relationship with the strategy norm. We also provide a very general monotonicity result for both the strategy fidelity and strategy norm under the actions of strategy-to-strategy linear maps. We illustrate an operational interpretation of the strategy fidelity in the spirit of Uhlmann's Theorem and discuss its application to the security analysis of two different quantum cryptographic tasks.

This is joint work with Gus Gutoski and Ansis Rosmanis.