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Resource theory of contextuality for arbitrary prepare-and-measure experiments

(joint work with Christhiano Duarte)

Contextuality has been identified as a potential resource responsible for the quantum advantage in several tasks. It is then necessary to develop a resource-theoretic framework for contextuality, both in its standard and generalized forms. In this work we provide a formal resource-theoretic approach for generalized contextuality based on a physically motivated set of free operations with an explicit parametrization. Then, using an efficient linear programming characterization for the noncontextual set of prepared-and-measured statistics, we adapt known resource quantifiers for contextuality and nonlocality to obtain natural monotones for generalized contextuality in arbitrary prepare-and-measure experiments.