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Analyses of Volume Thresholds in Quantum Fault Tolerance¹

GERALD GILBERT, YAAKOV WEINSTEIN, MITRE Quantum Information Science Group, ROBERT CALDERBANK, VANEET AGGARWAL, Princeton University — Operator theoretic techniques and methods were recently used to successfully determine the optimal constraints needed to achieve fault tolerance for identity gates in quantum computing. Fault tolerance constraints were expressed in terms of volume thresholds in the complete error manifold associated to the practical implementation of a quantum computer. We extend the use of these methods to more general qubit transformations.

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