

Recycling Quantum Computation.

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Abstract

Quantum feasibility hinges on the assumption that the basic gate's noise rate is below a certain threshold. Here we are studying the behavior of computation models when the noise is slightly greater than that threshold. In particular, We ask if one can design a fault tolerance schema such that if the noise is above the threshold, it is still grunted that the final generated state would have a value.

1 Introduction.

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Definition 1 (General Entanglement State). *We say that $|\psi\rangle$ is general entanglement if ..*

Definition 2 (Local-Measure-Circuit). *We say that a quantum circuit C is a local measure circuit if it's can be described as a decomposition of poly classical circuit and a constant depth quantum circuit which contains only 1-qubit gates and measurements.*

We would think about local measure circuits as chip circuits.

Definition 3 ($p_0 - \Delta$ Fault Tolerance Circuit). *We say that C is $p_0 - \Delta$ fault tolerance presentation of abstract circuit C if there exists a local measure circuit C_0 **2** such it's grunted that for noise $p < p_0$ C compute C w.h.p, And in addition, if $p \in (p_0, p_0 + \varepsilon)$ then by applying a C_0 on C output yields a general entanglement state **1***

[COMMENT] We would like to add a complexity parameter for the above definition, for example, "a general entanglement state over more than $\frac{1}{5}$ of the qubits.