

Strong entanglement causes low gate fidelity in inaccurate one-way quantum computation

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(Submitted on 1 Mar 2010)

We study how entanglement among the register qubits affects the gate fidelity in the one-way quantum computation if a measurement is inaccurate. We show that the mean gate fidelity is upper bounded by a decreasing function of the entanglement between the measured qubit and other qubits in the register. This means that if the amount of such entanglement is large, the gate fidelity is small. Since strong entanglement between a single qubit and other register qubits is often created during a quantum computation, this result suggests the necessity of accurate measurements in the one-way quantum computation.

Comments: 4 pages, 3 figures

Subjects: **Quantum Physics (quant-ph)**

Cite as: **[arXiv:1003.0293v1](#) [quant-ph]**

Submission history

From: Tomoyuki Morimae [[view email](#)]

[v1] Mon, 1 Mar 2010 09:58:33 GMT (63kb)

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