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Measurement-Based Quantum Network Coding on a Noisy Superconducting Processor

Monday, 4 July 2022 15:45 (15 minutes)

Measurement-Based Quantum Network Coding (MBQNC) is a recently introduced short-depth protocol for simultaneous transmission of quantum information through a bottleneck in a quantum network. MBQNC is studied here in the context of quantum information transfer within a noisy superconducting processor. We adapt the protocol to run on the new IBM Q falcon superconducting quantum processors by introducing a novel transpiling scheme and perform an experiment showing significant improvement in the final state quality of the protocol when compared to previous work. An analytical noise model based on depolarizing noise is developed which matches the experimental data with high accuracy, and the major source of noise propagation in the protocol is identified.

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

N/A

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