A Reliable Routing Method for Remote Entanglement Distribution under Limited Resources

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***Abstract*—Generating and distributing entangled pairs between arbitrary nodes is essential to fully realize the network's capabilities, with the challenges of limited qubit resources, severe decoherence and stochastic physical mechanism. In this paper, we model the service process of quantum repeater nodes based on the concept of queuing theory to help characterize their availability. Further, we propose a link-disjoint multi-path routing algorithm, with repeaters' availability, nodes' qubit capacity, entangled links' fidelity and classical delay taken into consideration. The performance of our scheme has been evaluated with simulated environment and compared with other existing routing schemes.**

***Keyword*—Quantum Networks, Entanglement Distribution, Queuing Theory, Routing Algorithm, Quantum Repeaters**

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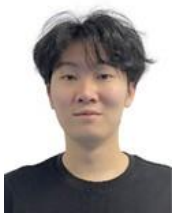

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