

Many-Agent Controlled Teleportation of Multi-qubit Quantum Information via Quantum Entanglement Swapping

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Abstract: We present a method to teleport multi-qubit quantum information in an easy way from a sender to a receiver via the control of many agents in a network. Only when all the agents collaborate with the quantum information receiver can the unknown states in the sender's qubits be fully reconstructed in the receiver's qubits. In our method, agents's control parameters are obtained via quantum entanglement swapping. As the realization of the many-agent controlled teleportation is concerned, compared to the recent method [C.P. Yang, et al., Phys. Rev. A 70 (2004) 022329], our present method considerably reduces the preparation difficulty of initial states and the identification difficulty of entangled states, moreover, it does not need local Hadamard operations and it is more feasible in technology.

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Key words: quantum teleportation, quantum information, quantum entanglement swapping

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