

Unsymmetrical Quantum Key Distribution Using Tripartite Entanglement

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Abstract: An unsymmetrical quantum key distribution protocol is proposed, in which Greenberger-Horne-Zeilinger (GHZ) triplet states are used to obtain the secret key. Except the lost qubits due to the unperfectness of the physical devices, the unsymmetrical characteristic makes all transmitted qubits useful. This leads to an excellent efficiency, which reaches 100% in an ideal case. The security is studied from the aspect of information theory. By using the correlation of the GHZ tripartite entanglement state, eavesdropping can be easily checked out, which indicates that the presented protocol is more secure.

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