

量子光学

基于三粒子纠缠态的未知单粒子态的量子秘密共享

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摘要:

提出了两个未知单粒子态的量子秘密共享方案, 分别使用一个对称的三粒子纠缠态和一个不对称的三粒子纠缠态作为量子信道来实现态的共享。在发送者和协助者分别对各自所拥有的粒子实施Bell基测量、单粒子态测量之后, 接收者对所拥有的粒子作相应的么正操作才能实现初始量子态的重构。方案可以推广至任意两粒子和多粒子纠缠态的量子秘密共享。在安全性方面, 考虑了来自外部和共享者内部的盗窃情况, 经讨论可认为所提出的方案是安全可靠的。

关键词: 量子光学 量子秘密共享 么正操作 量子态共享 量子信息分离

Quantum secret sharing of single-qubit state via tripartite entangled states

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Abstract:

Two schemes for quantum secret sharing of single-qubit state were proposed. A symmetric three-qubit entangled state and an asymmetric three-qubit entangled state was used as quantum channel, respectively. The sender performs Bell-basis measurements on her particles, and the cooperator operates single-particle measurements on his particles, then the state receiver can reconstruct the original state by applying the appropriate unitary operation. The schemes can also be generalized to the case of arbitrary two-qubit and multi-particle entangled state. The security against certain eavesdropping attacks is also considered. These protocols are considered to be secure.

Keywords: quantum optics quantum secret sharing unitary operation quantum state sharing quantum information splitting

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