2007 Vol.47 No.2 pp.257-260 DOI:

Scheme for Teleportation of a Multipartite Quantum State by Using a Single Entangled Pair as Quantum Channel

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(Received: 2006-3-1; Revised: 2006-4-24)

Abstract: We present a theoretical scheme for perfect teleportation of an unknown multipartite two-level state by a single EPR (Einstein-Podolsky-Rosen) pair, and then generalize it to multilevel, i.e., an N-quNit state can be teleported by a single quNit entangled pair, with additional local unitary operations. The feature of the scheme is that teleporting a multipartite state with a reduced amount of entanglement costs less classical bits.

PACS: 03.67.Hk, 03.67.Lx
Key words: EPR pair, quNit entangled pair, N-qubit cat-like state, N-quNit cat-like state, teleportation

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