

## Path-Spin to Spin-Spin Hybrid Quantum Entanglement: A Conversion Protocol

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**Abstract :** Path-spin hybrid entanglement generated and confined in a single spin-1/2 particle is converted to spin-spin hybrid interparticle entanglement, which finds its important applications in quantum information processing. This protocol uses beam splitter, spin flipper, spin measurement, classical channel, unitary transformations, etc., and requires no collective operation on the pair of particles whose spin variables share complete entanglement after the accomplishment of the protocol. The specialty of the protocol lies in the fact that the path-spin entanglement is transferred between spin degrees of freedom of two separate particles initially possessed by a single party.

**Keywords :** entanglement, path-spin entanglement, spin-spin entanglement, CNOT operation

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