

Energy-Entanglement Relation for Quantum Energy Teleportation

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Protocols of quantum energy teleportation (QET), while retaining causality and local energy conservation, enable the transportation of energy from a subsystem of a many-body quantum system to a distant subsystem by local operations and classical communication through ground-state entanglement. We prove two energy-entanglement inequalities for a minimal QET model. These relations help us to gain a profound understanding of entanglement itself as a physical resource by relating entanglement to energy as an evident physical resource.

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