

Quantum Generalized Measurement and Deterministic Generation of Maximum Entangled Pure State

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Abstract: We propose the concept of the quantum generalized projector measurement (QGPM) for finite-dimensional quantum systems by studying the quantum generalized measurement. This research reveals a distinguished property of this quantum generalized measurement: no matter what the system state is prior to the measurement and what the result of the measurement occurs, the state of the system after the measurement can be collapsed into any specified pure state, i.e., the state of quantum system can be deterministically reduced to any specified pure state just by a single QGPM. Subsequently, QGPM can be used to deterministically generate the maximum entangled pure state for quantum systems. We give three concrete theoretic schemes of generating the maximum quantum entangled pure states for two 2-level particles, three 2-level particles and two 3-level particles, respectively.

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