Abstract Submitted
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Classical Analogs of Quantum Entanglement[1] BRIAN LA COUR, The University of Texas at Austin — Quantum computing algorithms rely upon entanglement and context-based measurements, properties that are well exhibited by atomic or photonic systems. In some cases, these properties can be mimicked by cleverly contrived classical systems. We present a notional scheme for such classical analogs and compare their predictions to those of an associated quantum system. Entanglement is verified operationally using quantum tomography, wherein the quantum mixed state is inferred from measurements on a complete orthonormal set of Hermitian observables. Using the Peres-Horodecki criterion for separability, we examine the partial transpose of the estimated density matrix to establish a necessary, and in some cases sufficient, condition for entanglement. Through the use of Monte Carlo simulations, we find that certain classical systems do indeed exhibit a measurably significant level of entanglement.

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