Title:	Experimental classification of entanglement in arbitrary three-qubit pure states on an NMR quantum information processor
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Abstract:	We undertake experimental detection of the entanglement present in arbitrary three-qubit pure quantum states on an NMR quantum information processor. Measurements of only four observables suffice to experimentally differentiate between the six classes of states which are inequivalent under stochastic local operation and classical communication. The experimental realization is achieved by mapping the desired observables onto Pauli z operators of a single qubit, which is directly amenable to measurement. The detection scheme is applied to known entangled states as well as to states randomly generated using a generic scheme that can construct all possible three-qubit states. The results are substantiated via direct full quantum state tomography as well as via negativity calculations and the comparison suggests that the protocol is indeed successful in detecting tripartite entanglement without requiring any a priori information about the states.
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