Title:	Experimental construction of generic three-qubit states and their reconstruction from two-party reduced states on an NMR quantum information processor
Authors:	Dogra, S. (/jspui/browse?type=author&value=Dogra%2C+S.) Dorai, K. (/jspui/browse?type=author&value=Dorai%2C+K.) Arvind (/jspui/browse?type=author&value=Arvind)
Keywords:	generic three-qubit states NMR quantum single-qubit unitaries
Issue Date:	2015
Publisher:	American Physical Society
Abstract:	We experimentally explore the state space of three qubits on a nuclear magnetic resonance (NMR) quantum-information processor. We construct a scheme to experimentally realize a canonical form for general three-qubit states up to single-qubit unitaries. This form involves a nontrivial combination of Greenberger-Horne-Zeilinger (GHZ) and W-type maximally entangled states of three qubits. The general circuit that we have constructed for the generic state reduces to those for GHZ and W states as special cases. The experimental construction of a generic state is carried out for a nontrivial set of parameters and the good fidelity of preparation is confirmed by complete state tomography. The GHZ and W states are constructed as special cases of the general experimental scheme. Further, we experimentally demonstrate a curious fact about three-qubit states, where for almost all pure states, the two-qubit reduced states can be used to reconstruct the full three-qubit state. For the case of a generic state and for the W state, we demonstrate this method of reconstruction by comparing it to the directly tomographed three-qubit state.
URI:	https://journals.aps.org/pra/abstract/10.1103/PhysRevA.91.022312 (https://journals.aps.org/pra/abstract/10.1103/PhysRevA.91.022312) http://hdl.handle.net/123456789/2987 (http://hdl.handle.net/123456789/2987)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)

Files in This Item:

File	Description	Size	Format	
Need to add pdf.odt (/jspui/bitstream/123456789/2987/1/Need%20to%20add%20pdf.odt)		8.63 kB	OpenDocument Text	View/Open (/jspui/bitstream/12345

Show full item record (/jspui/handle/123456789/2987?mode=full)
(/jspui/handle/123456789/2987/statistics)