

Abstract Submitted
for the PSF16 Meeting of
The American Physical Society

Towards Generation of W- and Dicke-Class States for Quantum Information Processing Applications KISHOR KAPALE, Western Illinois University — Quantum Entanglement is an indispensable resource for several quantum information processing (QIP) tasks such as quantum teleportation, quantum secure communication, quantum dense coding, and quantum computing. Understanding the nature of entanglement and characterizing different entangled states is still an open area of research. In this context, it is interesting to note that slight differences in the nature of entanglement enhances or diminishes the utility of seemingly similar states for QIP. As an example, multi-qubit totally-symmetric Dicke and W states turn out to be unsuitable for deterministic quantum teleportation; however their analogs that lack this symmetry under exchange of the qubit labels turn out to be perfectly suitable for deterministic quantum teleportation and quantum dense coding. We are currently investigating protocols for generation of generalized Dicke and W states for atomic or atom-like entities using the tools of quantum optics. I will introduce this exciting world of quantum entangled states and discuss the progress we have made so far on developing methods to generate them.

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Date submitted: 16 Sep 2016

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