

Abstract Submitted
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Conditioned Homodyne Measurements and Entanglement for a Two-Level Atom in an OPO PERRY RICE, Miami University, JEFFREY HYDE — It has been shown that entanglement between a two-level atom and a field mode can be characterized by correlations between transmitted and fluorescent light. A particularly useful quantity is the cross-correlation function $h_{\theta=0}^{FT}(0)$, a conditioned homodyne measurement of the transmitted field, conditioned on the detection of a fluorescent photon. Obviously it would be better to create the photons in pairs via a parametric process. A two-level atom in an optical parametric oscillator has been shown to have nonclassical spectra and photon statistics and be useful for teleportation and single photon storage. Here we demonstrate that various cross-correlation functions are an indication of entanglement, and that the conditioned homodyne measurement is an actual measure of entanglement. Work supported by NSF, NIST, and Research Corporation.

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