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Entanglement evolution in cavity QED. D.L. FREIMUND, M.L. TERRACIANO, R. OLSON, L.A. OROZCO, University of Maryland, P.R. RICE, Miami University, J. GEA-BANACLOCHE, University of Arkansas — We investigate the evolution of entanglement in a strongly coupled cavity QED optical system when the driving field is weak enough that the steady state value of the intracavity photon number is less than the saturation photon number. We use a cross correlation between the transmitted intensity and the fluorescence of the atoms into modes other than that of the cavity: $j^{(2)}(\tau)$. We explore the parameter space, relevant for our current experiments, of the degree of entanglement as measured by $j^{(2)}(\tau)$. We find that it depends weakly on the number of atoms and the dipole coupling between the atom and the cavity; however we find that the degree of entanglement grows with the cavity linewidth and can reach an optimal value. We are currently characterizing a new cavity QED system and will report on our progress in the implementation of this cross-correlation function. This work is supported by NSF and NIST.

Luis Orozco
Physics, University of Maryland

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