Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Correlation Functions and Multipartite Entanglement in Cavity QED PERRY RICE, JAMES CLEMENS, Miami University, LUIS OROZCO, University of Maryland — Entanglement is essentially a quantum correlation between two systems, as such a cross-correlation function can be shown to indicate entanglement between two parts of a system. If the state of the system is a product state, with no entanglement, then the correlation function G is unity. If any cross correlation of the form above is not equal to one, then the two modes are entangled. Here we consider a multi-level atom, and two orthogonal polarization modes of the cavity. The atom is driven with polarization a. The atom can spontaneously emit into either the a mode, or the b mode. As the b mode is undriven, light of that polarization can only arise from spontaneous emission. Hence perhaps one can measure the entanglement between the atom and field mode by a cross-correlation of the two modes a and b. The problem with this is that we now have an atom and two field modes, and hence a tripartite system. In such systems, measures of entanglement are not well defined. Here we examine the use of correlation functions to discuss entanglement in this system. Work supported by NSF, NIST, and Research Corporation.

Perry Rice
Miami University

Date submitted: 28 Feb 2007 Electronic form version 1.4