Abstract Submitted
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Entanglement of multiple atoms via collective spontaneous emission JAMES CLEMENS, Miami University — We have carried out a theoretical and numerical investigation of the entanglement generated by multiple atoms located at arbitrary locations in free space undergoing collective spontaneous emission starting from the fully excited state. We use a quantum trajectory unraveling of the superradiance master equation derived by Lehmberg [Phys. Rev. A **2** 883 (1970)] based on direct photodetection of the emitted field. The amount of entanglement is quantified by calculating the von Neumann entropy for different groupings of the N atoms into two subsystems. Quantum trajectory theory holds an advantage for this investigation because the fundamental object is a state vector, conditioned on a sequence of photodetections, allowing us to use the unique measure of entanglement for pure states. We find that the entanglement develops during the course of the collective emission pulse starting from zero entanglement for the initial fully excited state.

James Clemens
Miami University

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