

Abstract Submitted  
for the DAMOP13 Meeting of  
The American Physical Society

**Collective shifts and frequency chirping in a superradiant system** GUIN-DAR LIN, ITAMP, Harvard-Smithsonian Center for Astrophysics and Harvard Physics Department, SUSANNE YELIN, ITAMP, Harvard-Smithsonian Center for Astrophysics and Harvard Physics Department; Department of Physics, University of Connecticut — In quantum optics, the energy shift and the stimulated emission rate are Kramers-Kronig pairs. Therefore when a superradiant system is considered, the cooperatively enhanced decay rate results in collective shifts and hence frequency chirping during the decay process. This effect, including the so-called collective Lamb shift, is investigated under a framework of two-body effective description, where we take into account the actual contribution of dipole-dipole interaction and inter-particle coherence.

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Date submitted: 30 Jan 2013

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