Abstract Submitted
for the DAMOP06 Meeting of
The American Physical Society

Superradiance in ultracold Rydberg atoms TUN WANG, ROBIN COTE, EDWARD EYLER, S. FAROOQI, PHILIP GOULD, MARIJAN KOSTRUN, DAVID TONG, University of Connecticut, DANIEL VRINCEANU, Los Alamos National Laboratories, SUSANNE YELIN, University of Connecticut
— Experiments in dense, ultracold Rydberg atoms show a considerable decrease of excited state lifetimes compared to dilute gases. We show, using a novel formalism, that this behaviour can be modeled and explained as superradiance-type decay. In addition, we find that the tendency to decay into the highest-possible frequency channel is reversed as the density increases, and thus long-wavelength decay into the closest lying level is the most probable.

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Date submitted: 27 Jan 2006 Electronic form version 1.4