

Abstract Submitted  
for the DAMOP17 Meeting of  
The American Physical Society

**Radiation enhanced antiferromagnetic exchange between spins in a superconducting host** KAMPHOL AKKARAVARAWONG, Univ of California - Berkeley, JUKKA VAYRYNEN, Yale University, JAY SAU, University of Maryland, LEONID GLAZMAN, Yale University, NORMAN YAO, Univ of California - Berkeley — A magnetic impurity on a conventional superconductor can host a localized bound state whose energy lies inside the superconducting gap. If the distance between two such impurities is smaller than the coherence length, the presence of these so-called Yu-Shiba-Rusinov (YSR) bound states can induce an antiferromagnetic exchange interaction between the impurities, falling off as  $1/r^2$ . Although the YSR interaction exhibits a slower decay than conventional RKKY interactions, its strength is significantly weaker, making it extremely challenging to experimentally observe. We demonstrate that the strength of the YSR interaction can be enhanced via radiation assisted virtual occupation, and that the signature of this coupling can naturally be observed through spectroscopy.

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Date submitted: 29 Jan 2017

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