

Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Progress towards long-range Rydberg molecules with ^{87}Sr ¹
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DUNNING, THOMAS KILLIAN, Rice University — Many recent experiments
have probed the interactions between highly-excited Rydberg atoms and nearby
ground state atoms, allowing the study of a wide range of phenomena such
as few-body, long-range Rydberg molecules in thermal gases^{2,3} ($\sim 10^{13}\text{cm}^{-3}$)
and many-body effects in Bose-Einstein condensates⁴ ($\sim 10^{14}\text{cm}^{-3}$). These ex-
periments have exclusively been performed with bosons. We report our re-
sults working with the fermionic isotope ^{87}Sr ($I = 9/2$) with which one
can hope to see modified molecular structure and suppression of short-range
collisional loss due to the Pauli exclusion principle. We will describe the
spectra for two-photon excitation to the $5sns^3S1$ Rydberg state from a spin –
polarized sample and our progress towards obtaining Rydberg molecular spectra.

¹Research supported by the AFOSR, the NSF, and the Robert A. Welch Foundation.

²V. Bendkowsky *et al.*, Nature (London) **458**, 1005 (2008).

³B. J. DeSalvo *et al.*, Phys. Rev. A **92**, 031403 (2015).

⁴M. Schlagmiller *et al.*, Phys. Rev. Lett. **116**, 053001 (2016).

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Date submitted: 28 Jan 2017

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