Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Progress on direct photoassociation of halo molecules in ultracold ^{86}Sr[1] JAMES AMAN, JOSHUA HILL, R. DING, F. B. DUNNING, T. C. KILLIAN, Rice Univ — We report progress on the creation of $^1S_0$+$^1S_0$ halo molecules in strontium 86 through direct photoassociation in an optical dipole trap. By driving a two photon Raman transition near-resonance with a molecular level of the $^1S_0$+$^3P_1$ interatomic potential, we explore a unique regime of photoassociation where the driving fields are separeted by small energy differences. A simple isolated resonance model confirms the binding energy, $E_b \approx 84$ kHz at low excitation-laser intensity. Additionally, we have investigated the effects of density shifts and trap intensity on the observed halo binding energy. Large observed Frank-Condon factors suggest that STIRAP should be very effective for improving molecular conversion efficiency. Further experiments in a 3D lattice will explore molecular lifetimes and collision rates.

[1]Travel support provided by Shell Corporation

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Date submitted: 26 Jan 2018 Electronic form version 1.4