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Production and Trapping of Ultra-cold RbCs Molecules ERIC HUDSON, NATHAN GILFOY, Department of Physics, Yale University, New Haven, Connecticut 06520, USA, JEREMY SAGE, MIT Lincoln Laboratory, Lexington, MA 02420, USA, SUNIL SAINIS, Department of Mechanical Engineering, Yale University, New Haven, Connecticut , DAVID DEMILLE, Department of Physics, Yale University, New Haven, Connecticut 06520, USA — Our lab has recently demonstrated the production of ultracold polar RbCs molecules in their vibronic ground state, via photoassociation of laser-cooled atoms followed by a laser-stimulated state transfer process. The resulting sample of $X^1\Sigma^+(v = 0)$ molecules has a translational temperature of $\sim$100 μK and a narrow distribution of rotational states. With this method it should be possible to produce samples even colder in all degrees of freedom, as well as other bialkali species. Currently, we are implementing a quasi-electrostatic trap (QUEST) to collect the photoassociated molecules for further observation. Specifically, we wish to observe the strong, anisotropic collisions of these polar molecules as a function of an additional static, external electric field. We will report on our progress towards observing these collisions as well as our efforts to implement stimulated Raman adiabatic passage to improve the transfer efficiency of the molecules to the absolute ground state.

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