

Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Ultra-cold polar molecules in an optical trap ERIC HUDSON, Yale University, NATHAN GILFOY, Yale University, STEPHAN FALKE, DAVID DEMILLE, Yale University — We have recently confined ultra-cold RbCs molecules in an optical trap. Currently, these molecules are in high-lying vibrational levels of the $a^3\Sigma^+$ ground electronic state. Inelastic collision rates of these molecules with both Rb and Cs atoms have been determined for individual vibrational levels, across an order of magnitude of binding energies. A simple model for the collision process is shown to accurately reproduce the observed scattering rates. We are currently implementing a state transfer process, previously demonstrated in our lab, to transfer these molecules into the $X^1\Sigma^+(v=0)$ absolute ground state, which possesses a large electric dipole moment ($\mu \approx 1.3$ Debye). We will report on our recent measurements of ultra-cold inelastic molecular collisions as well as our progress towards the trapping of absolute ground state polar molecules.

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Date submitted: 01 Feb 2008

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