

Abstract Submitted  
for the DAMOP19 Meeting of  
The American Physical Society

**Controlled Reactivity of Degenerate Polar Molecules** WILLIAM TOBIAS, LUIGI DE MARCO, GIACOMO VALTOLINA, KYLE MATSUDA, JUNRU LI, JUN YE, JILA/CU-Boulder — We have recently achieved Fermi degeneracy of polar molecules via coherent association in a degenerate Bose-Fermi atomic mixture. The onset of degeneracy was accompanied by suppression of chemical reactions below the classical prediction, indicating dependence of reactivity on spatial correlations or many-body interactions in the degenerate gas and prompting further investigation into the reaction dynamics.

We present progress towards two-dimensional confinement of potassium rubidium molecules. In this geometry, electric field-induced dipole-dipole interactions are predicted to further suppress chemical reactions and assist thermalization, allowing direct evaporation to deeper degeneracy. Experimental control over dipolar interaction strength and dimensionality will provide insight into the dynamics of chemical reactions in a degenerate gas. In conditions where chemical reactions are suppressed, interactions between degenerate molecules will allow exploration of many-body correlated phases.

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Date submitted: 01 Feb 2019

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