Abstract Submitted
for the DAMOP09 Meeting of
The American Physical Society

Electric manipulation of ultracold polar ^{40}K^{87}Rb molecules in a magnetic field[1] GOULVEN QUÉMÉNER, JOHN BOHN, JILA, University of Colorado, Boulder — Ultracold fermionic polar molecules of ^{40}K^{87}Rb in their absolute rovibronic ground state ($v = 0, n = 0, ^1\Sigma$) have been created recently [1] in a magnetic trap and open new perspectives to create fermionic degenerate gases of polar molecules. To achieve this goal, it is very important to understand the collisional properties of such molecules under magnetic and electric fields. In our presentation, we investigate ground state fermionic ^{40}K^{87}Rb + ^{40}K^{87}Rb collisions in the presence of a magnetic field and explore the possibility to control these collisions when an electric field is applied. We will explore the main physical processes that can lead to such manipulation. This problem is complicated by the Zeeman and Stark splitting of all levels of the polar molecules and by the possibility of forming ^{40}K$_2$ + ^{87}Rb$_2$ chemical products.

1 - K.-K. Ni, S. Ospelkaus, M. H. G. de Miranda, A. Pe'er, B. Neyenhuis, J. J. Zirbel, S. Kotochigova, P. S. Julienne, D. S. Jin, and J. Ye, Science **322**, 231 (2008).

[1]This work was supported by NIST and NSF.

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Date submitted: 23 Jan 2009 Electronic form version 1.4