

Abstract Submitted  
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**Dynamics of reactive ultracold alkali polar molecules**<sup>1</sup> GOULVEN QUÉMÉNER, JOHN BOHN, JILA, University of Colorado, ALEXANDER PETROV, SVETLANA KOTOCHIGOVA, Temple University — Recently, ultracold polar molecules of KRb have been created. These molecules are chemically reactive and their lifetime in a trap is limited [1]. However, their lifetime increases when they are loaded into a 1D optical lattice in the presence of an electric field [2]. These results naturally raise the question of manipulating ultracold collisions of other species of alkali dimer molecules, with an eye toward both novel stereochemistry, as well as suppressing unwanted reactions, to enable condensed matter applications. In this talk, we report on a comparative study between the bi-alkali polar molecules of LiNa, LiK, LiRb, LiCs which have been predicted to be reactive [3]. We compute the isotropic  $C_6$  coefficients of these systems and we predict the elastic and reactive rate coefficients when an electric field is applied in a 1D optical lattice. We will discuss the efficacy of evaporative cooling for each species.

[1] Ni et al., *Science* 322, 231 (2008); Ospelkaus et al., *Science* 327, 853 (2010); Ni et al., *Nature* 464, 1324 (2010). [2] Quéméner et al., *Phys. Rev. A* 81, 060701(R) (2010) ; Quéméner et al., *Phys. Rev. A* 83, 012705 (2011); de Miranda et al., arXiv:1010.3731, to appear in *Nature Physics*. [3] Zuchowski et al., *Phys. Rev. A* 81, 060703(R) (2010).

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