Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Collisional losses and dipolar interactions in lattice gases of cold polar molecules MARTIN GAERTTNER, ANA MARIA REY, JILA, NIST, Department of Physics, University of Colorado — Recent experimental progress has enabled the observation of dipolar spin exchange interactions between ultracold KRb molecules in different rotational states trapped in a deep optical lattice [1]. In the same experiment, for molecules confined to one dimensional tubes, it was found that losses caused by inelastic collisions are suppressed due to the quantum Zeno effect [2]. Here, we study situations in which the interplay between both, dipolar interactions and losses due to reactive collisions, leads to interesting new phenomena. The observation of the loss dynamics reveals information about system properties, such as the density of molecules in the lattice. Moreover, the dissipative preparation of useful entangled states of molecules can be achieved.

[1] B. Yan et al., Nature 501, 521-525 (2013).
[2] B. Zhu et al., Phys. Rev. Lett. 112, 070404 (2014).

Martin Gaerttner
JILA, NIST, Department of Physics, University of Colorado

Date submitted: 29 Jan 2015 Electronic form version 1.4