Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Creating Fermionic Ground State Molecules of ^{23}Na^{40}K with Strong Dipolar Interactions[1] JEE WOO PARK, CHENG-HSUN WU, JENNIFER SCHLOSS, SEBASTIAN WILL, MARTIN ZWIERLEIN, Massachusetts Institute of Technology — In our experiment, we work towards creating fermionic ground state molecules of ^{23}Na^{40}K with strong dipolar interactions. These molecules will be chemically stable in the rovibrational ground state, and will carry a large induced dipole moment of 2.72 Debye. Building up on our previous work [1, 2], we have done photoassociation spectroscopy on the ^{23}Na-^{40}K mixture in order to understand the molecular excited state potentials and identify possible intermediate states for efficient STIRAP transfer of Feshbach molecules down to the absolute rovibrational ground state. In addition, our recent effort in doing two-photon spectroscopy to locate the absolute rovibrational ground state will be presented. Our work paves the way towards creating stable dipolar quantum gases, which will open up new avenues to quantum many-body phases with intriguing properties such as supersolidity and topological phases.

[1] J. W. Park et al., Phys. Rev. A 85, 051602(R) (2012)
[2] C.-H. Wu et al., Phys. Rev. Lett. 109, 085301 (2012)

[1]This work was supported by the NSF, AFOSR-MURI and -PECASE, ARO-MURI, ONR YIP, DARPA YFA, a grant from the Army Research Office with funding from the DARPA OLE program and the David and Lucille Packard Foundation.

Jee Woo Park
Massachusetts Institute of Technology

Date submitted: 25 Jan 2013 Electronic form version 1.4