Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Towards production of ultracold molecular ions in a hybrid trap system[1] SCOTT SULLIVAN, WADE RELLERGERT, KUANG CHEN, STEVEN SCHOWALTER, University of California, Los Angeles, SVETLANA KOTOCHIGOVA, Temple University, ERIC HUDSON, University of California, Los Angeles — We describe a new method for the production of ultracold molecular ions. This method utilizes sympathetic cooling due to the strong collisions between appropriately chosen molecular ions and laser-cooled neutral atoms to realize ultracold, internal ground-state molecular ions. In contrast to other experiments producing cold molecular ions, our proposed method efficiently cools both the internal and external molecular ion degrees of freedom. The availability of truly ultracold molecular ions will impact fields as diverse as quantum chemistry, precision measurement, and quantum information/computation. We present preliminary results towards demonstration of rovibrational relaxation in $BaCl^+$.

[1]Work supported by NSF grant No. PHY-1005453, ARO No. W911NF- 10-1-0505, and AFOSR grant.

Scott Sullivan
University of California, Los Angeles

Date submitted: 30 Jan 2012 Electronic form version 1.4