

Abstract Submitted  
for the DAMOP11 Meeting of  
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**Preliminary results on a new method for producing ultracold molecular ions**<sup>1</sup> SCOTT SULLIVAN, WADE RELLERGERT, KUANG CHEN, STEVEN SCHOWALTER, University of California, Los Angeles, SVETLANA KOTCHIGOVA, 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. Observations of neutral-ion interactions have been made using laser-induced fluorescence of Yb ion interacting with MOT.

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