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Light assisted charge exchange interaction between potassium (K) atoms and calcium ions (Ca^+) ions in an ion-atom hybrid trap JYOTHI SARALADEVI, ERIC PRETZSCH, KENNETH BROWN, Duke University — In the past decade, hybrid ion-atom traps enabled us to study rich chemical interactions between laser cooled and trapped ions and atoms. Controlling these chemical interactions by manipulating the internal states of ions and atoms is an exciting new research direction in this field. In this talk, we present our investigation of charge exchange interaction between laser cooled potassium (K) atoms in a magneto optical trap (MOT) and calcium (Ca^+) ions in a linear Paul trap. The charge exchange interaction is observed to be photon mediated, and the interaction rate coefficient can be controlled by manipulating the electronic state population of Ca^+ ions. Our experimental observations are in good agreement with theoretical calculations.

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