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Study of Cold Phase Chemistry Using a Hybrid Atom-Ion Setup¹ KISRA EGODAPITIYA, JYOTHI SARALADEVI, ZHUBING JIA, Duke University, GANG SHU², Georgia Institute of Technology, ROBERT CLARK, Georgia Tech Research Institute, PIERO CHIAPPINA, Georgia Institute of Technology, KENNETH BROWN, Duke University — We report the first measurements in a cold potassium atom calcium ion hybrid experiment. Hybrid atom-ion systems enable the study of processes such as charge exchange, cold molecular formation, and quenching of internal states of atoms and molecules at unprecedented low energies. The cold potassium atoms are produced in a Magneto Optical Trap (MOT), and cold calcium ions are produced by Doppler cooling calcium ions trapped in a linear ion trap (LIT). Cold atom-ion dynamics are probed using fluorescence of ions and atoms, and a radial ejection time of flight spectrometer that enables high-resolution detection of trapped ion species in the ion trap. We observe a fast decay of Calcium ions due to the interaction with cold potassium atoms.

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