

Abstract Submitted
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Study of Cold Potassium Atom - Calcium Ion Reactions KISRA EGODAPITIYA, SHU GANG, Department of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332, ROBERT CLARK, Department of Physics, The Citadel, Charleston, SC, 29409, KENNETH BROWN, Department of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332 — We report on our progress towards constructing a hybrid system for studying reactions between cold Potassium (K) atoms and cold Calcium (Ca^+) ions. Ca^+ ions will be trapped and Doppler-cooled inside a linear quadrupole ion trap. Cold K atoms will be created inside a magneto optical trap, such that the ion and the atoms are in an overlapping volume. Trapping and re-pumping beams for the Potassium MOT are derived from the same laser with wavelength 766 nm using two acousto optic modulators. The reaction products will be detected using a time-of-flight mass spectrometer that is designed to detect radially ejected ions. The main objective of this experiment is to study the rate coefficients, and identification of reaction channels between cold K atoms and Ca^+ ions. Subsequently this setup will be used to study reactions between cold K atoms and sympathetically cooled molecular ions such as CaO^+ , and to study internal state quenching of molecular ions.

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