

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

A gas cell experiment for charge exchange cross sections with highly charged ions STEVEN BROMLEY, DANIEL FOX, CHAD SOSOLIK, JIM HARRISS, JOAN MARLER, Clemson Univ — Observations of x-rays from highly charged ions in astrophysical plasmas motivates the study of these systems in the laboratory. The dominant process involving highly charged ions is charge exchange between the ion and neutrals. We present a gas cell experiment, optimized for experiments with highly charged ions, for measuring the total charge exchange cross sections for velocity-resolved ion beams interacting with neutrals. Preliminary results with Ar^+ beams interacting with neutral Ar are consistent with published results. We extend the study to measure the scaling of the cross-sections for 1 - 5 keV Ne^{q+} , Ar^{q+} , and Kr^{q+} ($q = 1$) beams interacting with neutral atoms and molecular nitrogen. Further work will investigate the scaling of the cross sections with target atomic number Z for multi-charged noble gas ions interacting with neutrals.

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Date submitted: 30 Jan 2018

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