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Progress towards proton-lithium charge transfer collision experiments PAUL OXLEY, The College of the Holy Cross — We report recent progress on experiments to measure total charge transfer cross-sections for collisions between protons and lithium atoms. Initial experiments will use ground state lithium atoms and protons with energies in the range 1-10keV, while later experiments will investigate lower proton energies. Only one experimental investigation has been made at these lower energies [1] and is in disagreement with theoretical predictions. Future experiments with laser-excited lithium atoms are also envisioned. Total charge transfer cross-sections will be measured by detecting lithium ions emerging from the collision site, and by measuring the lithium beam density and the proton beam current. We describe experimental measurements of our lithium atomic beam and proton beam systems and outline the design and experimental progress made on the lithium ion detection apparatus. Our studies have interest from a fundamental physics standpoint and for their applications to fusion plasma diagnostics using injected lithium beams.

[1] S. L. Varghese, W. Waggoner, and C. L. Cocke, Phys. Rev. A **29**, 2453 (1984).

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