

Abstract Submitted  
for the NEF06 Meeting of  
The American Physical Society

**Apparatus For Laser Excitation of Lithium Atoms.**<sup>1</sup> JAMES DALY, SUZY FLAHERTY, PAUL OXLEY, Holy Cross College — We have constructed and tested a vacuum system and a simple lithium oven. Lithium atoms from this oven will be excited to high principal quantum number by a combination of three lasers. We have also built and tested the hardware needed to operate the first of these lasers. In the future we will study charge transfer collisions between excited lithium atoms and ions to gain a better understanding of the physical properties of fusion, astrophysical, and other types of plasmas. Our vacuum system is assembled from standard conflat vacuum parts and from parts designed and built at Holy Cross. The vacuum environment is maintained by a diffusion pump in conjunction with a cold water trap to prevent pump oil migrating into our vacuum system. Our lithium oven consists of a small steel tube filled with lithium and mounted inside our vacuum system. The oven is heated by high temperature heater tapes. We have reached oven temperatures of over 600C which provides a sufficiently intense Li beam for our needs. The laser used in the first excitation step of lithium is a diode laser operating at 671nm. We have assembled the mechanical structure used to mount the diode laser and collimate its light output. Commercial electronics control the laser diode current and its temperature. Initial tests of the properties of the laser have been made.

<sup>1</sup>We thank the Research Corporation and Holy Cross College for financial support

Paul Oxley  
Holy Cross College

Date submitted: 03 Oct 2006

Electronic form version 1.4