

Abstract Submitted
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Magnetic field structure in laser photodetachment to the first excited state of the O atom¹ JOSEPH MARTIN, HANNAH THIGPEN, JOHN YUKICH, Davidson College — Photodetachment spectroscopy for ions such as S⁻ and O⁻ has been examined in previous experiments for detachment to the ground state of the neutral atom. In many of these experiments, structure in the cross section due to Zeeman and cyclotron transitions has been resolved. Our current experiment examines a transition to the first excited state of the O neutral in an attempt to detect similar cyclotron and Zeeman structure. The apparatus in the experiment includes a Penning ion trap which creates, traps and stores the O⁻ ions, and a single-mode, tunable, amplified diode laser. Although the overall transition is much weaker than transitions to the ground state of the neutral, we have observed cyclotron structure in detachment to the ³P₁ excited state. It is anticipated that analysis of the data will yield a measurement of the ²P_{1/2} → ³P₁ electronic transition energy.

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