

Abstract Submitted  
for the DAMOP11 Meeting of  
The American Physical Society

**Low-Resolution Photodetachment Spectroscopy of the  $S_2^-$  Ion<sup>1</sup>**

JOHN N. YUKICH, ANNE JOINER, ROBERT MOHR, Davidson College — Numerous experiments have investigated the properties and dynamics of single-atom negative ions. Similar experiments can be conducted with molecular negative ions. Laser photodetachment spectroscopy of such ions is more complicated due to rotational and vibrational structure, and often yields spectroscopic benchmarks such as rotational constants. We have conducted low-resolution photodetachment spectroscopy of the  $S_2^-$  ion. The ions are created in a Penning ion trap by a two-step dissociative attachment process. The photodetachment is achieved with a tunable ring-cavity titanium:sapphire laser. Our results yield a lower-limit estimate of the minimum detachment threshold energy and exhibit structure that may be due to rotational energy levels. Future experiments will focus on high-resolution detachment spectroscopy of these and other ions with an eye toward measurement of their molecular constants.

<sup>1</sup>Support from Davidson College and the American Chemical Society

John N. Yukich  
Davidson College

Date submitted: 01 Feb 2011

Electronic form version 1.4