

Abstract Submitted
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Laser Vibrational Photodetachment Spectroscopy Near the Electron Affinity of S_2 ¹ JOHN YUKICH, COLIN TYZNIK, Davidson College, JESSICA BARRICK, University of North Carolina - Chapel Hill — Numerous experiments have investigated the properties and dynamics of single-atom negative ions. Similar experiments may also be conducted with molecular anions. Laser photodetachment spectroscopy of such ions is more complex due to rotational and vibrational structure, but often yields spectroscopic benchmarks such as rotational constants and vibrational energies. In this experiment, photodetachment spectroscopy of the S_2^- anion is conducted over photon energies in the range of the S_2 electron affinity. The S_2^- anions are created by a two-step dissociative attachment process to a carrier gas of OCS. These anions are then stored in a Penning ion trap. The photodetachment is achieved with a widely-tunable, single-mode, titanium: sapphire laser. Our results are consistent with a model adapted from previous studies of single-atom photodetachment, and also show evidence of successful evaporative cooling of the ion cloud. Future experiments will focus on high-resolution detachment spectroscopy of these and other anions with an eye toward measurement of their molecular constants.

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