

Abstract Submitted
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Laser Photodetachment Spectroscopy of the S_2^- Ion¹ JOHN YUKICH, WADE MORGAN, 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 over a range of roughly 2000 cm^{-1} . 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.

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John Yukich
Davidson College

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