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Photodetachment from the S^- ion at the $^2P_{1/2} \rightarrow {}^3P_2$ threshold[1]
JOHN N. YUKICH, Davidson College, JAMES E. WELLS, University of Connecticut — Numerous experiments have investigated photodetachment spectroscopy in a magnetic field at the $^2P_{3/2} \rightarrow {}^3P_2$ threshold of ions such as S^- and O^-. The energy of this threshold is known as the atom's *electron affinity*. In this work we have investigated detachment at the lowest-lying threshold for the S^- ion, the $^2P_{1/2} \rightarrow {}^3P_2$ threshold. Our experimental apparatus includes a Penning ion trap in which the ions are created, trapped and stored, and a single-mode, ring dye laser. Our observations yield a quantitative measurement for the threshold energy and an indirect measurement for the spin-orbit splitting of the S^- ion.

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