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Magnetic field structure in photodetachment from the $^2\mathbf{P}_{1/2} \rightarrow {}^3\mathbf{P}_2$ threshold of the $\mathbf{O}^-$ ion[1] JOHN N. YUKICH, ANNE JOINER, ROBERT H. MOHR, Davidson College — Numerous experiments have examined photodetachment in a magnetic field at the $^2\mathrm{P}_{3/2} \rightarrow {}^3\mathrm{P}_2$ threshold of ions such as S^- and O^-. The threshold energy is known as the atom's *electron affinity*. Many of these experiments have resolved cyclotron and Zeeman structure in the detachment cross section. We report on an experiment that for the first time has visually resolved magnetic field structure in detachment at the lowest-lying threshold for the O^- ion, the $^2\mathrm{P}_{1/2} \rightarrow {}^3\mathrm{P}_2$ threshold. Our experimental apparatus includes a Penning ion trap in which the ions are created, trapped and stored, and a single-mode, amplified diode laser. Our observations also yield a quantitative measurement for the threshold energy.

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