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Photodetachment Cross Sections in External Magnetic Fields CHRISTIAN BRACHER, ARNULFO GONZALEZ, YIGAL WEINSTEIN, California State University Long Beach — Near-threshold photodetachment of negative atomic ions provides an almost monochromatic, nearly pointlike source of electrons that can be used to probe the quantum dynamics of electrons in externally applied electromagnetic fields. These fields cause modulations both in the observed photocurrent spectrum, and the spatial distribution of the emitted photoelectrons. In the case of a uniform electric field, the changes in the photocurrent are well understood, and have been used to establish photodetachment microscopy as a tool in precision spectroscopy. Considerably more intricate patterns arise when the photodetachment is performed in a magnetic field environment. In our contribution, we examine the total photocurrent as well as the photoelectron density profile for electrons emitted in the presence of either a homogeneous magnetic field, or a magnetic monopole field. Employing Green function methods and semiclassical techniques as complementary approaches, we identify and explain some distinctive features in the detachment cross sections.

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