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Photoionization Cross-Section Measurements in a Rubidium Magneto-Optical Trap[1] ALINA GEARBA, BRAD CROCHET, KILEIGH PETURIS, CHARLES YOUNG, University of Southern Mississippi — Photoionization cross-section measurements are relevant for fundamental tests of the atomic theory, as well as state-selective detection of trapped atomic and molecular species and plasma research, including ultracold plasma formation. We have extended the current photoionization cross-section measurements of the $5P_{3/2}$ exited state of rubidium by including three additional wavelengths close to the ionization threshold of 479.1 nm. The measurements were performed in a rubidium magneto-optical trap using several lines from a mixed argon-krypton ion laser ranging from 457.9 nm to 476.5 nm. The photoionization rate for each wavelength was determined from the loss rate of atoms in the trap during exposure to the ionizing laser radiation. Our results are in good agreement with other experimental results and allow for comparison with theoretical predictions of the photoionization cross section versus the ionizing photon energy.

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