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Absolute Photoionization of Rb^+ and Br^{2+} Ions for the Determination of Elemental Abundances in Astrophysical Nebulae ALLISON MUELLER, DAVID MACALUSO, University of Montana, NICHOLAS STERLING, Valparaiso University, ANTONIO JUAREZ, Instituto de Ciencias Físicas UNAM, ILEANA DUMITRIU, The Advanced Light Source and Hobart and William Smith Colleges, RENE BILODEAU, The Advanced Light Source and Western Michigan University, EDDIE RED, The Advanced Light Source and Morehouse College, DAVID HARDY, The Advanced Light Source and Louisiana State University, ALEX AGUILAR, The Advanced Light Source — It has only recently become possible to detect neutron(n)-capture elements in large numbers of ionized astrophysical objects. Measuring the abundances of these elements can reveal their dominant production sites in the Universe, as well as details of stellar structure, mixing, and nucleosynthesis. However, abundance determinations are highly dependent on the accuracy of the available atomic data. This has motivated an extensive laboratory astrophysics program to measure absolute single photoionization cross sections of the observed $n-$capture ion species. As part of this program, Rb^+ and Br^{2+} ions have been measured at the Advanced Light Source at Lawrence Berkeley National Laboratory using the merged-beams technique. Both ions were measured from the metastable region to beyond their direct ionization threshold in a region rich with auto-ionizing resonances. Included in the analysis is the identification of several Rydberg series using quantum defect theory. This research was supported by the DOE, NASA, NASA/EPSCoR, and the Montana Space Grant Consortium.

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