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Searching for Heavy Elements in Neutron Star Merger Ejecta: High resolution UV-VIS spectroscopy of Au I, Au II, Au III[1] S. J. BROMLEY, Clemson University, C. A. JOHNSON, C. E. SOSOLIK, Auburn University, P. C. STANCIL, University of Georgia, D. A. ENNIS, S. D. LOCH, Auburn University, J. P. MARLER, Clemson University — The astrophysical origin of heavy Z elements remains an open question. Spectroscopy of neutron star merger ejecta provides a new opportunity to directly probe regions where heavy elements may be forming, specifically as a result of active r-process nucleosynthesis. However, comparable laboratory and theoretical atomic data are not available for even low charge states of heavy Z elements. We present experimental and theoretical investigations for the electronic structure of Au I, Au II, and Au III. Using the Compact Toroidal Hybrid plasma experiment at Auburn University, neutral Au is sputtered and excited. Observed spectral lines for Au I, Au II, and Au III are reported.

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