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Studies of Keldysh Scaled Systems with Ultrafast Strong-Field Sources URSZULA SZAFRUGA, COSMIN BLAGA, JUNLIANG XU, The Ohio State University, ANTHONY DICHIARA, Argonne National Laboratory, EMILY LINK, NIF and Photon Sciences, LLNL, PIERRE AGOSTINI, LOUIS DIMAURO, The Ohio State University — Keldysh theory [1] suggests that we can control the multiphoton/tunneling ionization mechanism by choosing appropriate laser parameters and target atoms. The Keldysh parameter values for the noble gases at near-infrared wavelengths (0.8 micron) are similar to those of the alkali metal atoms in strong mid-infrared (3-4 micron) laser fields. By studying atomic species with similar Keldysh parameters and different electronic structures (noble gases vs alkali metals) we aim to expand our understanding of the global, Keldysh invariant, and atom specific ionization features. Further, since alkali metal atoms have a single valence electron they may provide a more appropriate test of theories based off of the single-active-electron approximation. In this work we measured photoelectron spectra and ion yields of Sodium, Potassium and Cesium spanning the range of multiphoton and tunneling ionization regimes. Our findings are discussed in relation to previous results in noble gas/800nm experiments and compared to ADK, SFA and TDSE calculations.

[1] L. V. Keldysh, "Ionization in the field of a strong electromagnetic wave", Zh. Eksp. Teor. Fiz. **47**, 1945 (1964). [Sov. Phys. JETP **20**, 1307 (1965)].

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