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Comparative analysis of theories of relativistic photoionization[1]
BAHMAN HAFIZI, DANIEL GORDON, JOHN PALASTRO, Naval Research Laboratory — Laser-plasma experiments routinely rely on photoionization for plasma formation. For large laser intensities or for high-Z atoms relativistic effects become important. We investigate a unique regime of relativistic photoionization from high-Z atoms where relativistic effects modify both the bound and continuum electronic states. Theories of photoionization are based on the imaginary time method and the S-matrix method, amongst others. We compare the results of these approaches for both the Dirac and the Klein-Gordon equations. Analytical results for the momentum distribution of ejected electrons and ionization rate are presented and compared with those from numerical solutions.

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Bahman Hafizi
Naval Research Laboratory

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