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The Influence of Nonlinear Optical Processes on Intense X-ray Laser Driven Ionization Dynamics[1] KENNETH WHITNEY, Berkeley Research Assoc. , Inc., TZVETELINA PETROVA, JACK DAVIS, Naval Research Laboratory — The non-equilibrium dynamics in which hole states are created and destroyed when an incident coherent, high intensity, x-ray laser pulse impacts planar gold targets is modeled. Two aspects of the modeling are investigated. On the one hand, sufficiently low laser intensities lead to ionization rates that depend linearly on laser intensity and ionization levels are limited by the strength of ionization cross sections, the x-ray pulse duration, and the pulse intensity. On the other hand, at sufficiently high laser intensities, ionization rates with a quadratic and higher dependence on laser intensity begin to compete with linear rates. Where this transition is expected to occur is investigated along with its effect on ion populations.

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Tzvetelina Petrova
Naval Research Laboratory

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