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Time-dependent atomic kinetics modeling of a neon photoionized plasma experiment at Z[1] T. DURMAZ, I. HALL, R. MANCINI, University of Nevada, Reno, J. BAILEY, G. ROCHAU, Sandia National Laboratories, D. COHEN, Swarthmore College, M. FOORD, R. HEETER, Lawrence Livermore National Laboratory — We present a modeling study of time-dependent atomic kinetics for a neon photoionized plasma. The neon atomic model considers several ionization stages of highly-charged neon ions as well as a detailed structure of non-autoionizing and autoionizing energy levels in each ion. Atomic processes populating and depopulating the energy levels consider photoexcitation and photoionization due to the external radiation flux, and spontaneous, stimulated and collisional atomic processes including plasma radiation trapping. Relevant atomic cross sections and rates were computed with the FAC code. The calculations are performed at constant particle number density and driven by the time-histories of temperature and external radiation flux. These conditions were selected in order to resemble those achieved in current photoionized plasma experiments at the Z facility. We also calculate transmission spectra in an effort to identify time-dependent effects in observed spectral features.

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