

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

New Set of Prism Atomic Data, EOS and Opacity tables IGOR GOLOVKIN, JOSEPH MACFARLANE, Prism Computational Sciences, Inc. — We present a new set of atomic data tables generated with the updated data from the latest release of NIST atomic database. The new set also includes corrections for known inconsistencies in atomic structure calculations. Prism's ATBASE suite of atomic physics codes was used to generate high-quality atomic data for simulating the spectral properties and ionization dynamics of plasmas over a wide range of conditions. Atomic energy levels and oscillator strengths are computed using Hartree-Fock and configuration interaction models. Photoionization cross-sections from Hartree-Fock calculations are utilized for both valence-shell and inner-shell transitions. Radiative recombination rate coefficients are calculated from the photoionization cross-sections. Distorted-wave calculations are performed to generate electron collisional excitation and ionization cross-sections and rate coefficients. Autoionization rates include configuration interaction models. For dielectronic recombination related to K-shell spectra (Li-like ions and higher), electron capture rates are computed using autoionization rates and the detailed balance relationship. For lower ionization stages, total dielectronic recombination rate coefficients are based on semi-empirical models. A new set of EOS and opacity tables is generated with PROPACEOS code based on the new atomic data. We will discuss details of the calculations and demonstrate application of the new data to the analysis of several sets of experimental data.

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Date submitted: 14 Jul 2017

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