Abstract Submitted
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Improved Ionization Equilibrium Calculations for Optically Thin Plasmas[1] DANIEL WOLF SAVIN, Columbia University, PAUL BRYANS, Naval Research Laboratory, NIGEL R. BADNELL, University of Strathclyde, United Kingdom, THOMAS W. GORCZYCA, Western Michigan University, J. MARTIN LAMING, Naval Research Laboratory, WARIT MITTHUMSIRI, Stanford University — Reliably interpreting spectra from electron-ionized laboratory and cosmic plasmas requires accurate ionization balance calculations for the plasma in question. However, much of the atomic data needed for these calculations have not been generated using modern theoretical methods and their reliability are often highly suspect. We have carried out state-of-the-art calculations of dielectronic recombination (DR) rate coefficients for the hydrogenic through Na-like ions of all elements from He to Zn as well as for Al-like to Ar-like ions of Fe. We have also carried out state-of-the-art radiative recombination (RR) rate coefficient calculations for the bare through Na-like ions of all elements from H to Zn. Using our data and the recommended electron impact ionization data of Dere (2007), we present improved collisional ionization equilibrium calculations. We compare our calculated fractional ionic abundances using these data with those presented by Mazzotta et al. (1998) for all elements from H to Ni.

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Daniel Wolf Savin
Columbia University

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