Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Dielectronic Recombination Calculations of M-shell Ions[1] DUCK-HEE KWON, Columbia University, Korea Atomic Energy Research Istitute, MING FENG GU, University of California at Berkeley, DANIEL WOLF SAVIN, Columbia University — Understanding the properties of astrophysical and laboratory plasmas necessitates knowing the ionization balance of the observed or modelled source. This in turn depends on the underlying recombination and ionization processes. Of particularly importance are data for the electron-ion recombination process known as dielectronic recombination (DR) which is the dominant recombination mechanism for most ions. While much work has been carried out for K- and L-shell ions, little state-of-the-art theoretical results exist for M- shell ions. The aim of our work is to calcuate modern DR rate coefficients for all M-shell ions ranging from Mg to Zn. We use the the Flexible Atomic Code (FAC) which is a relativistic, multiconfigurational, distorted-wave atomic package and consider all $\Delta N = 0$ and $\Delta N = 1$ core electron excitations. All possible radiative decay and autoionization channels are taken into account. Configuration mixing effects and decay to autoionizing levels followed by radiative cascades (DAC) are also considered.

[1]This work is supported in part by the NASA APRA and SHP SR&T programs.

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Date submitted: 15 Jan 2010 Electronic form version 1.4