Abstract Submitted
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Dielectronic Recombination of Argon-Like Scandium: A Revisited Theoretical Investigation[1] D. NIKOLIC, J. FU, T.W. GORCZYCA, Western Michigan University, D.W. SAVIN, Columbia Astrophysics Laboratory, N.R. BADNELL, University of Strathclyde, UK — As an improvement to an earlier study [1], we have calculated dielectronic recombination rate coefficient spectra for Sc^{3+} ions as a test case toward the assembly of a database [2] for the Ar-like isoelectronic sequence required for modeling of dynamic finite-density plasmas [3]. Our theoretical spectra contain dominant $\Delta N = 0$ and $\Delta N = 1$ core excitation channels and exhibit nearly all features found in a recent ion storage ring experiment [4]. In order to compare Maxwellian-averaged rate coefficients, which are of main interest to the astrophysics community, we have developed an iterative deconvolution procedure that enables us to extract the cross section from storage ring data. After folding the resultant cross section with a Maxwellian electron velocity distribution, theoretical and experimental rate coefficient spectra agree to better than ∼18%, subject to field re-ionization effects via high Rydberg states in Sc^{2+} ions.
[1] T. W. Gorczyca, et al., Phys. Rev. A **56**, 4742 (1997).
[2] http://homepages.wmich.edu/∼gorczyca/drdata/.
[3] N. R. Badnell, et al., A&A **406**, 1151 (2003).
[4] S. Schippers, et al., Phys. Rev. A **65**, 042723 (2002).

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