Recombination and ionization cross sections for all ion stages of argon.[1] SH. A. ABDEL-NABY, S.D. LOCH, M.S. PINDZOLA, Department of Physics, Auburn University, Auburn, AL36849, USA , N.R. BADNELL, Department of Physics, The University of Strathclyde, Glasgow, G4 ONG, UK — We present a range of ionization and recombination cross section calculations for all ionization stages of argon, for application in tokamak plasma disruption mitigation studies. The ionization cross sections are evaluated in a configuration-average distorted-wave (CADW) approach, benchmarking against experiment for the lower ion stages. The CADW cross sections are also compared with more accurate level-resolved distorted-wave calculations. The dielectronic-recombination cross sections are also evaluated in a CADW approach for all ion stages for $\Delta n = 0$ and $\Delta n = 1$ core excitations. These cross sections are compared with more accurate level resolved distorted-wave results for ion stages Ar^{6+} through to Ar^{17+}. We use this comparison as a means of estimating the accuracy of the CADW method for ion stages Ar^+ through to Ar^{5+}, which are currently beyond the reach of level-resolved perturbative methods. We also compare with various semi-empirical approaches for these ion stages. The atomic cross sections are processed into Maxwellian rate coefficients for use in plasma modeling.

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