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Abstract Submitted
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Collisional radiative model for Ar/O₂ plasma with reliable fine structure resolved cross sections.¹ PRITI PRITI, Indian Institute of Technology Roorkee, Roorkee, India, REETESH GANGWAR, Weizmann Institute of Science, Rehovot, Israel, RAJESH SRIVASTAVA, Indian Institute of Technology Roorkee, Roorkee, India — A collisional radiative (CR) model has been developed for Ar/O₂ mixture plasma. Here we extend our previous CR model for pure Ar plasma [1] by including the quenching of the excited Ar atoms with O₂ along with the other processes *viz.* radiative population transfer, electron impact excitation and ionization. Since electron collision processes play vital role, a complete data set obtained using relativistic distorted wave theory is used. Present work is in the light of recent measurement [2] on Ar/O₂(0-5%) mixture plasma at 2 Torr pressure. Diagnostics have been done by optimizing the normalized intensities obtained from this model with the measured intensities [2] for different transitions between fine structure levels. The population densities of fine structure states of Ar(1s) are obtained and compared with the measurements [2] at different O₂ fractions. The electron temperature is found to increase (0.9 to 1.8eV) with O₂ fraction (0-5%).

1. Dipti *et. al.*, *Eur. Phys. J. D* **67** 203, 2013

2. Jogi *et. al.*, *J. Phys. D: Appl. Phys.* **47** 335206, 2014.

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