

Abstract Submitted
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Method to Estimate the Electron Temperature and the Neutral Density in a Plasma from Spectroscopic Measurements Using Argon Atoms and Argon Ions Collisional-Radiative Models¹ ELLA M. SCIAMMA, ROGER D. BENGTON, KEVIN E. CASEY, W.L. ROWAN, The University of Texas at Austin, AMY M. KEESEE, West Virginia University, CHARLES A. LEE, DAN BERISFORD, KEVIN LEE, KENNETH GENTLE, The University of Texas at Austin — We present a method to infer the electron temperature in argon plasmas using a collisional-radiative model for argon ions [1] and measured electron density to interpret absolutely calibrated spectroscopic measurements of argon ion (Ar II) line intensities. The neutral density, and hence the degree of ionization of this plasma, can then be estimated using spectroscopic argon atoms (Ar I) line intensities and a collisional radiative model for argon atoms [2]. This method has been tested for plasmas generated on two different devices at the University of Texas at Austin: the helimak experiment and the helicon experiment. We present results that show good correlation with Langmuir probe measurements.

[1] <http://adas.phys.strath.ac.uk>

[2] Amy. M. Keesee and Earl E. Scime. Rev. Sci. Instrum. 77, 10F304 (2006).

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