

Abstract Submitted  
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**Stark broadening for determination of electron density and electron temperature in an atmospheric pressure arc**<sup>1</sup> JENNA R. PUCKETT, MATTHEW R. KING, CHRISTOPHER J. OLDHAM, JEROME J. CUOMO, Department of Materials Science and Engineering, NC State University — Determining basic plasma parameters for low frequency, atmospheric pressure discharges is often difficult. However, insight into these parameters is imperative for understanding fundamental processes in all plasma applications. Because Stark broadening of lines in the hydrogen Balmer series depend on electron temperature ( $T_e$ ) and electron density ( $N_e$ ), lineshape analysis can be used to determine these parameters. This technique has been developed in the literature and we find it can be applied to a low frequency, atmospheric pressure arc. The effects of power and frequency on  $N_e$  and  $T_e$  were examined in a gas mixture of argon and 0.5% hydrogen using an Ocean Optics HR2000 spectrometer (groove density of  $2400\text{mm}^{-1}$ ). Nitrogen was added to study the effect of other gases on plasma parameters with the Stark broadening technique.

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