Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Variation of density and temperature in an electron beam produced plasma[1] JENNY SMITH, CHRISTOPHER DUROT, JOHN FOSTER, University of Michigan, DAVE HINSHELWOOD, STUART JACKSON, STEVE SWANEKAMP, Naval Research Laboratories — Electron beam produced plasmas at reduced pressures associated with high altitude are not well studied. Experimental measurements can be used to validate model development. In this work, the variation in line integrated electron density and average electron temperature at various time intervals relative to the beginning of the pulse are determined. Using density data derived from an interferometer and spectral line emission recorded by a time-gated spectrograph, the electron temperature is determined using the using the line-ratio method [1]. The temporal variation of the temperature and density are then compared with the results from a global model for validation. These findings support the development of a more advanced model which includes more extensive gas phase chemistry. [1] Isola, L M, Gómez, B J, and Guerra, V, "Determination of the electron temperature and density in the negative glow of a nitrogen pulsed discharge using optical emission spectroscopy," Journal of Physics D: Applied Physics, vol. 43, no. 1, p. 015202, 13/1/2010

[1]Work supported by DTRA and NRL through grant number N00173-18-2-C009, and by NDSEG fellowship.

Jenny Smith
University of Michigan

Date submitted: 16 Jun 2020 Electronic form version 1.4