

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Schlieren Technique Applied to Magnetohydrodynamic Generator Plasma Torch¹ NIRBHAV CHOPRA, JACOB PEARCY, MICHAEL JAWORSKI, Princeton Plasma Physics Lab — Magnetohydrodynamic (MHD) generators are a promising augmentation to current hydrocarbon based combustion schemes for creating electrical power. In recent years, interest in MHD generators has been revitalized due to advances in a number of technologies such as superconducting magnets, solid-state power electronics and materials science as well as changing economics associated with carbon capture, utilization, and sequestration. We use a multi-wavelength schlieren imaging system to evaluate electron density independently of gas density in a plasma torch under conditions relevant to MHD generators. The sensitivity and resolution of the optical system are evaluated alongside the development of an automated analysis and calibration program in Python. Preliminary analysis shows spatial resolutions less than 1mm and measures an electron density of $n_e = 1 \times 10^{16} \text{ cm}^{-3}$ in an atmospheric microwave torch.

¹Work supported by DOE contract DE-AC02-09CH11466.

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Date submitted: 14 Jul 2017

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