

Abstract Submitted  
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**Electrical and optical characteristics of a low-frequency atmospheric plasma discharge**<sup>1</sup> CHRISTOPHER J. OLDHAM, MATTHEW R. KING, C. RICHARD GUARNIERI, JEROME J. CUOMO, Department of Materials Science and Engineering, NC State University — The electrical and optical characteristics of a capacitive discharge operated at atmospheric pressure were studied. The discharge was operated with and without dielectric barriers to investigate how the discharge behaved using a low frequency power source. Plasma formation was found at three main harmonics; 30 kHz, 80 kHz, and 150 kHz. In addition, other higher frequency components approaching the MHz regime were found to contribute to plasma generation. The presence of the dielectric barriers significantly effected discharge properties. With the electrodes covered by dielectric barriers, the alpha-gamma transition occurs with increasing power. Without dielectric barriers, the discharge was constricted and operated only in the abnormal mode of operation. Spatial results from the He I (706 nm) emission profile along with gas temperature measurements from the N<sub>2</sub><sup>+</sup> rotational band will be presented.

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