Abstract Submitted
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Modelling of Electrode Configurations for Nanosecond Pulsed Plasmas[1] NANCY ISNER, PRATEEK GUPTA, TATYANA SIZYUK, CARLO SCALO, ALLEN GARNER, Purdue University — Nanosecond repetitively pulsed plasmas (NRPPs) can efficiently generate ionized/excited species. While studies have elucidated the impact of local flow fields [1], the influence of electrode geometry and the induced flow field remains incomplete. We hypothesize that the electrode configuration will strongly influence the electric field, plasma species generation, and the induced flow field, motivating the development of a complete model to couple these phenomena. This study couples a quasi-one dimensional model for a parallel plate geometry [2] to BOLSIG+ to improve plasma species characterization [3]. The implication of electrode configurations, such as pin-to-plate and pin-to-plate, on the induced electric field and generated species will be examined. The long-term incorporation of this model into a high fidelity computational fluid dynamics (CFD) model and comparison to spectroscopic results under quiescent and flowing conditions will be discussed. 1. A. V. Likhanskii, M. N. Shneider, S. O. Macheret, and R. B. Miles, J. Appl. Phys. 103, 053305 (2008). 2. I. V. Adamovich, M. Nishihara, I. Choi, M. Uddi, and W. R. Lempert, Phys. Plasmas 16, 113505 (2009). 3. G. J. M. Hagelaar and L. C. Pitchford, Plasma Sources Sci. Technol. 14, 722–733 (2005).

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