

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Computational Study of Nanosecond Electric Pulse Parameters on Plasma Species Generation¹ NANCY ISNER, JONATHAN POGGIE, ALLEN GARNER, Purdue University — Nanosecond pulsed plasmas (NPPs) can efficiently generate ionized/excited species from vacuum to atmospheric pressure [1]. While studies have elucidated the impact of voltage on local flow fields [2], the influence of pulse parameters, such as pulse duration and rise- and fall-times, and the species generated by the discharges remains incomplete. We examine the effect of pulse conditions on the electric field and generated plasma species by coupling a quasi-one dimensional model for a parallel plate geometry [1] to BOLSIG+ to improve plasma species characterization [3]. 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. T. Piskin, V. Podolsky, S. Macheret, and J. Poggie, *J. Phys. D. Appl. Phys.* 52, 304002 (2019). 2. A. V. Likhanskii, M. N. Shneider, S. O. Macheret, and R. B. Miles, *Phys. Plasmas* 14, 073501 (2007). 3. G. J. M. Hagelaar and L. C. Pitchford, *Plasma Sources Sci. Technol.* 14, 722–733 (2005).

^{1*} Work supported by NSF/DOE.

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Date submitted: 02 Jul 2019

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