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Modeling Streamer Physics in 2D and 3D Wedge Pin-to-Plane Geometries via a PIC-DSMC Code[1] ASHISH JINDAL, CHRIS MOORE, ANDREW FIERRO, MATTHEW HOPKINS, Sandia National Laboratories — Streamer propagation physics is investigated in 2D and 3D pin-to-plane geometries via a PIC-DSMC code with an air model[1] using Townsend breakdown and streamer mechanisms via tracking excited state neutrals that can either undergo quenching or spontaneous photon emission collisions[2]. A 100 μm radius 1 eV-10^{18}m^{-3} plasma placed at the tip of a 100 μm hemispherical pin electrode (at 6 kV) in a 600 Torr air filled gap, 1.5 mm above a planar grounded cathode, seeds the domain. Prior 2D studies have shown that E/n can significantly impact streamer evolution[3]. We extend the analysis to 3D wedge geometries (to limit computational costs) with wedge angle swept from 10^o to 45^o to examine its effect on streamer branching, propagation, and particle noise. 1. C.Moore *et al.*, *Development of PIC-DSMC Air Breakdown Model in the Presence of a Dielectric*, ICOPS, 2016. 2. A.Fierro *et al.*, *Discrete Photon Implementation for Plasma Simulations*, Physics of Plasma, 23, 2016. 3. A.Jindal *et al.*, *Streamer Formation Near a Dielectric Surface with Variable Quantum Efficiency*, ICOPS, 2017.

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