

Abstract Submitted
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Intermediate frequency breakdown DEREK MONAHAN, MILES TURNER, Dublin City University — The mechanisms underlying low-frequency/dc and high-frequency breakdown differ greatly due to the contrasting nature of the charged particle trajectories. At low-frequencies charged particle trajectories are open, terminating at the electrodes, and secondary electron production at the cathode plays a central role in the breakdown process. At high-frequencies, and typical discharge dimensions, charged particle oscillations are closed. In this limit trajectories have a diffusive nature and ionization via field heated bulk electrons plays a central role in breakdown. Between these two frequency extremes one may envisage a regime in which electron trajectories are open and ion trajectories are closed. While experiments confirm breakdown may be achieved in such a regime, a plausible breakdown mechanism does not appear to have been identified. In this paper we investigate breakdown in this regime using a kinetic simulation and propose a breakdown mechanism in which secondary electron production via fast neutral bombardment of the electrodes plays a significant role.

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