

Abstract Submitted
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Similarity of Radio-Frequency Discharges in Nonlocal Regimes.¹

YANGYANG FU, BOCONG ZHENG, PENG ZHANG, QI HUA FAN, JOHN P. VERBONCOEUR, Michigan State University, XINXIN WANG, Tsinghua University — We report the fully kinetic results from particle-in-cell/Monte Carlo collision simulations that unambiguously demonstrate the similarity of radio-frequency discharges in nonlocal regimes, where the electron energy relaxation length is much larger than the gap dimension. Similar discharges are obtained in various scaled gaps when the gas pressure, gap dimension, and applied voltage frequency are simultaneously tuned through a scaling factor. The scaling relations of fundamental discharge parameters are illustrated, and the temporal electron kinetics are shown to have invariance in similar discharges, which validates the similarity laws in nonlocal kinetic regimes.

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