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Modeling High-Voltage Breakdown for Single- and Multi-stack Dielectric Insulators

MANUEL ALDAN, JOHN VERBONCOEUR, Univ. of California, Berkeley, Y.Y. LAU, Univ. of Michigan, JOHN BOOSKE, Univ. of Wisconsin — Breakdown from DC through microwave in dielectric-insulator configurations with one or more segments will be investigated using an improved 2D PIC simulation model [1]. The goal of this work is to develop the capability to predict and control the breakdown threshold under a wide range of parameters and geometries. Effects considered include secondary-emission [2], space-and surface-charge, ambient and desorbed gas, and surface-plasma generation for single- and multiple-layer [3] insulators with applied fields from DC to THz frequencies. Comparison between simulation and experiment will be conducted where possible.


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