

Abstract Submitted
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Modeling High-Voltage Breakdown for Angled Dielectric Insulators¹ MANUEL ALDAN, Univ. of California, Berkeley, JOHN VERBONCOEUR, Michigan State Univ. — Angled dielectric-insulator breakdown is investigated using an improved 2D PIC model [1]. This work will develop the capability to predict and control breakdown thresholds by ordering various contributions to breakdown. Models emphasize secondary-emission [2], space-charge, dielectric-surface charge, and single- and multi-layer [3] angled-insulator configurations in DC fields. Effects of seed current, field emission, ambient and desorbed gas, and applied RF fields will also be studied. Key observations of single-layer multipactor DC breakdown [4] simulations with an imposed constant-current show: positive dielectric-surface charging, avalanche current developing in a few hundred ps, saturation by shortened secondary lifetimes, and absence of avalanche breakdown at large angles due to space-charge effects.

[1] Taverniers, S., et al., ICOPS 2009 Proc., 2009.

[2] Vaughan, J.R.M., IEEE TED, Vol. 36, No. 9, 1989, pp.1963- 1967.

[3] Leopold, J.G., et al., Proc. 2010 PMHVC.

[4] Jordan, N.M., et al., J. Appl. Phys., 102, 2007.

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