

Abstract Submitted
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Chemical and Gas Modification of Surfaces for Vacuum Breakdown Reduction and Prevention¹ CARLOS H. CASTANO GIRALDO, M. AGHAZARIAN, C. CALVEY, D.N. RUZIC, Plasma-Material Interaction Group, University of Illinois at Urbana-Champaign, J.B.O. CAUGHMAN, Oak Ridge National Laboratory, Oak Ridge, TN — The Plasma Material Interaction Group at the University of Illinois and the Fusion Energy Division of ORNL have been conducting breakdown studies to improve voltage hold-off to ultimately improve the performance of ICRF antennas used in fusion applications. The current understanding of the breakdown initiation on RF systems points to the formation of a local microplasma initiated by field emission.² The microdischarge formed enhances the local electric field to the point of producing an explosive emission of electrons. We are studying the chemical and gas modification of surfaces that will reduce field emission and prevent the formation of microdischarges that initiate the breakdown process. The effect of SF₆ and XeF₂, and other gases on well-characterized emitters is revealed.

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²Advanced Themometry Studies of Superconducting Radio-Frequency Cavities. J. Knobloch. PhD Thesis Cornell University. 1997

Carlos H. Castano Giraldo
Plasma-Material Interaction Group,
University of Illinois at Urbana-Champaign.

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