Abstract Submitted
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Theory and Experimental Characterization of Multipactor RF Window Breakdown[1] GEOFFREY GREENING, MATTHEW FRANZI, PENG ZHANG, Y.Y. LAU, ADAM SCHUTT, RONALD GILGENBACH, University of Michigan — Multipactor breakdown of RF windows is a potential defense against high-power microwaves. By applying a DC bias across a dielectric window in a vacuum-gas environment, the threshold for the onset of RF-initiated multipactor can be lowered. Recent Monte Carlo simulations of multipactor in a background gas with a DC bias have provided a theoretical baseline for comparison against experimental results [1]. Prior experimental work used a 1 kW CW, 2.45 GHz magnetron to direct RF at a Lucite vacuum window with embedded copper wires providing the DC bias. Results confirmed that a DC bias was effective at reducing the threshold for multipactor in air at sub-torr pressures, though with high variability. Continuing efforts include exploration of breakdown in argon at >5 torr to improve reproducibility of experimental results. Ongoing work is also combining the theories developed in [1] and [2] to characterize multipactor susceptibility in the presence of a background gas and a static magnetic field using Monte Carlo simulations.

[1] P. Zhang et al., Phys. Plasmas 18, 053508 (2011).
[2] A. Valfells et al., Phys. Plasmas 7, 750 (2000).

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