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Dielectric Window Breakdown on the UM/L-3 Relativistic Magnetron¹ B.W. HOFF, R.M. GILGENBACH, Y.Y. LAU, D. FRENCH, M.A. FRANZI, University of Michigan, M.D. HAWORTH, P.J. MARD AHL, Air Force Research Laboratory — Experiments were performed on the UM/L-3 (6-vane, L-band) relativistic magnetron to test a new microwave window configuration designed to limit vacuum side breakdown. Originally, each microwave window was mounted 3 cm from its corresponding anode cavity, separated by an aperture. In this case, vacuum side window breakdown was observed to initiate at single waveguide output powers close to 20 MW. Moving the microwave windows further away from the anode apertures and redesigning the window mounts eliminated window breakdown at powers of 120+ MW. Examination of window damage suggests that impacts from electrons emanating from the magnetron assembly are responsible for initiating the vacuum side microwave window breakdown in the baseline case. PIC modeling is in progress to investigate probable electron sources responsible for initiating the window breakdown events.

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Brad Hoff
60032425

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