

Abstract Submitted
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Experiments and Simulations on a Prototype Recirculating Planar Magnetron¹ G. GREENING, N. JORDAN, R. GILGENBACH, S. EXELBY, P. ZHANG, D. SIMON, M. FRANZI², Y.Y. LAU, Nuclear Eng. & Rad. Sciences Department, University of Michigan — The Multi-Frequency Recirculating Planar Magnetron (MFRPM) is a type of Recirculating Planar Magnetron, a crossed-field, high power microwave source, with the added benefit of simultaneous oscillation at more than one primary frequency.³ Prior research focused on the design of a dual L/S-band MFRPM prototype to demonstrate simultaneous operation at 1 GHz and 2 GHz. Dual frequency microwave emission on this prototype was recently demonstrated on the Michigan Electron Long Beam Accelerator with a ceramic insulator (MELBA-C), which drives the MFRPM by applying a -300 kV, 0.3–1.0 μ s pulse to the cathode. Experiments are underway to characterize operation of the MFRPM prototype. Microwave power extraction and different cathode designs are also being explored to improve operation.⁴ Results are compared to simulations of the experimental setup using the MAGIC particle-in-cell and HFSS finite-element codes.

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²Current address: SLAC Natl. Accel. Laboratory.

³R.M. Gilgenbach et al., “Crossed Field Device”, U.S. 2011/0204785 A1, Aug. 25, 2011, Patent Pending.

⁴M. Franzi et al., Phys. Plasmas 20, 033108 (2013).

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