

Abstract Submitted
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Experimental Results on the Harmonic Recirculating Planar Magnetron with All Cavity Extraction¹ DREW PACKARD, NICHOLAS JORDAN, CHRISTOPHER SWENSON, STEVEN EXELBY, Y.Y. LAU, RONALD GILGENBACH, University of Michigan, BRAD HOFF, Air Force Research Lab — Harmonic-frequency locking was originally observed on the Multi-Frequency Recirculating Planar Magnetron (MFRPM) [1], which is a high power microwave source that can generate multi-MW power levels at two frequencies simultaneously. To understand harmonic-frequency locking, the Harmonic Recirculating Planar Magnetron (HRPM) has been designed with oscillators at L-Band and S-Band (LBO and SBO, respectively). In the harmonic locked state, the SBO frequency locks to the harmonic of the LBO's frequency. Power is extracted from the SBO using coaxial-all-cavity-extraction [2]. Under certain operating parameters, the SBO has been observed to generate 9.3 +/- 1.4 MW when driven by MELBA-C, which applies -300 kV and 1-5 kA for 0.3-1.0 μ s. The completed design, relevant simulations, and experimental results will be presented. [1] Greening et al, "Harmonic Frequency Locking in the Multi-Frequency Recirculating Planar Magnetron", IEEE T-ED, vol. 65, 2347, (2018). [2] Franzi et al, "Coaxial All Cavity Extraction in the Recirculating Planar Magnetron," IEEE International Vacuum Electronics Conference, 2014.

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