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Microwave Power Measurements on the Recirculating Planar Magnetron[1] N.M. JORDAN, M. FRANZI[2], G.B. GREENING, R.M. GILGENBACH, D.H. SIMON, Y.Y. LAU, Nuclear Eng. & Rad. Sciences Dept., Univ of Michigan, Ann Arbor, B.W. HOFF, AFRL, J.W. LUGINSLAND, AFOSR — The recirculating planar magnetron (RPM)[3] is a high power microwave generator that recirculates the beam in two-coupled, planar magnetrons. Experiments on the first L-band prototype[4] have successfully produced 50-200 μs, 30-130 MW microwave pulses with instantaneous electronic efficiencies of up to 30% at approximately 1 GHz. The device is driven using MELBA-C, with parameters of: -300 kV for 0.3-1.0 μs, and 0.15-0.3 T axial magnetic fields. Recent RPM experiments have explored the effect of cathode surface treatment on the extracted microwave power, efficiency, and pulse width. This work utilized a proof of principle extraction system with antennas on the center vane of each oscillator to couple RF power into two, coaxial transmission lines. An advanced design, the Coaxial All Cavity Extractor, is in fabrication and will be discussed.

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[2]Present address: Stanford Linear Accelerator Center (SLAC)
[3]R.M. Gilgenbach, et. al., IEEE Trans. Plasma Sci., V39, p980-987 (2011)
[4]M.A. Franzi, et. al., IEEE Trans. Plasma Sci., V41, p639-645 (2013)

Nicholas Jordan
Nuclear Eng. & Rad. Sciences Dept., Univ of Michigan, Ann Arbor

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