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**Experimental Verification of Magnetron Operation with a Transparent Cathode** SARITA PRASAD, MIKHAIL FUKS, C. JERALD BUCHENAUER, EDL SCHAMILOGLU, University of New Mexico — Magnetrons are considered to be one of the most efficient sources of high power microwaves. However, the rather slow start of oscillations makes them unattractive for short-pulse applications. At the University of New Mexico (UNM) we proposed a new cathode design, namely the transparent cathode that provides fast start of oscillations in magnetrons [1]. Furthermore, we have been able to demonstrate via 3-dimensional particle-in-cell simulations that the magnetron output characteristic is significantly improved using the transparent cathode [2]. We have successfully modified the short-pulse electron beam accelerator “SINUS-6” at UNM that will be used for experimental verification of our simulation results. SINUS-6 has a pulse duration of 16 ns and is now capable of delivering 320 kV and a total current of 13 kA to the magnetron load. Experimental results of magnetron operation with a transparent cathode and solid cathode will be presented. [1] M. Fuks et al, “Rapid Start of Oscillations in a magnetron with a Transparent Cathode”, *Phys. Rev. Lett.*, vol 95, pp. 205101-1-205101-4, 2005. [2] H. Bosman et al., “Improvement of the Output Characteristics of Magnetrons Using the Transparent Cathode”, *IEEE Trans. Plasma Sci*, 34 (4), 606 (2006).

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