

Abstract Submitted  
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**Magnetron with axial output of radiation**<sup>1</sup> M. FUKS, E. SCHAMILOGLU, University of New Mexico — As the limiting case of a magnetron with diffraction output [1], we consider a magnetron with axial extraction of electromagnetic energy through a cylindrical waveguide joined to the resonant system. A short length of waveguide with small cross section (less than cut off for the radiated wave) is placed between the resonant system and the output waveguide to obtain the optimal Q-factor. This magnetron is very compact due to its symmetrical design, even when the magnetic system is included. Importantly, any synchronous mode can be used as the operating mode because of identical loads for all the cavities. Computer simulations of the well-known A6 magnetron geometry, using the 3D fully relativistic particle-in-cell code MAGIC, demonstrate stable operation for the  $2\pi$ -type of oscillations, with radiation power of about 0.7 GW and radiation frequency of 3 GHz. Electron efficiency is about 15% when and the applied voltage is 350 kV. Application of a cathode [2] that consists of several individual longitudinal emitting strips arranged in a cylindrical geometry, provides fast start of oscillations. [1] M. Fuks and N. Kovalev, Program and abstracts of XI Int. Conf. On High Power Electromagnetics, Tel-Aviv, 1998, 23. [2] M. Fuks and E. Schamiloglu, Papers of USA-Japan Meeting on Plasma Science, Hawaii, 2004, 71-76.

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