Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Simulation of mode competition and start-up in a grounded-cathode Magnetron[1] KATIA GOMBEROFF[2], JONATHAN WURTELE, Department of Physics, UC Berkeley, Berkeley CA 94720 — Simulations results of a relativistic magnetron using the MAGIC PIC code are reported. The time evolution of the buildup process for different magnetron azimuthal modes is studied for a variety of initial voltages, with and without a second, oscillatory small voltage in addition to the drive. The self-field is seen to evolve so that the anode-cathode voltage nears the Buneman-Hartree voltage of a particular mode. Simulations show that the output power is larger than in the case where the voltage dynamically approaches the Buneman-Hartree value from above than when it is approached from below. An oscillatory voltage, of relatively small amplitude and possibly chirped in frequency is seen to modify mode competition. Small changes in the azimuthal structure are seen to lead to different mode dynamics; when the π mode symmetry is enforced other competing modes are greatly suppressed.

[1]Work supported in part by the US Department of Energy, Office of High-Energy Physics, and in part by MAFAT, Israel
[2]On sabbatical leave from RAFAEL, Israel

Katia Gomberoff
Department of Physics, UC Berkeley, Berkeley CA 94720

Date submitted: 19 Jul 2005 Electronic form version 1.4