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Equilibrium and Stability of the Brillouin Flow in Inverted Magnetron DAVID SIMON, YUE YING LAU, MATT FRANZI, GEOFF GREENING, RONALD GILGENBACH, University of Michigan, Ann Arbor, PETER MARHDAHL, BRAD HOFF, AFRL, Kirtland AFB, NM, JOHN LUGINSLAND, AFOSR, Arlington, VA — One embodiment of the novel recirculating planar magnetron, RPM [1] utilizes an inverted configuration for fast startup. While the negative mass behavior on the thin electron layer model [2] is well-known for the inverted magnetron, the corresponding behavior for the equilibrium Brillouin flow [3] is an open question. Simulations using the particle-in-cell codes ICEPIC and/or MAGIC will be performed and compared to the solution to the eigenvalue problem that governs the stability of Brillouin flow, leading to a fundamental study of the flow's negative, positive, and infinite mass properties. Research supported by AFOSR (grant#: FA9550-10-1-0104), AFRL, and L-3 Communications Electron Devices.

[1] R. M. Gilgenbach, et.al., IEEE Trans. Plasma Sci. 39, 980 (2011); Also patent pending.
[2] D. M. French, et al., Appl. Phys. Lett. 97, 111501 (2010).
[3] D. Simon, et al., Phys. Plasmas 19, 043103 (2012).

David Simon
University of Michigan, Ann Arbor

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