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Fluid simulation of a xenon microwave plasma cathode: focus on electron current avalaible and its extraction LAURENT LIARD, YU ZHU, GERJAN HAGELAAR, JEAN-PIERRE BOEUF, Laplace, CNRS and University of Toulouse, France — Electron sources are a major part of electric propulsion systems, for neutralization of ion beams. Recently, different plasma sources have been investigated as possible alternative cathodes. We presented here a 2D fluid simulation of resonant cavity microwave plasma which has shown promising results [1]. The resonant part of the cylindrical cavity eases the plasma breakdown, and the plasma is then sustained by the microwave through a dielectric. The fluid code has been extensively described in [2]. Results show typical working conditions, and stress the maximum electron current that could be extracted from this kind of discharge, given an absorbed power. Results on the extraction aperture dimensions, and its effect on the actual current obtained are also commented.

[1] K. D. Diamant, IEEE Trans. On Plasma Sci. 37.8, p. 1558 (2009)

[2] Hagelaar, G. J. M., Makasheva, K., Garrigues, L. and Boeuf, J.-P. J. Phys. D: Appl. Phys. 42 (2009) 194019

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