

Abstract Submitted
for the GEC12 Meeting of
The American Physical Society

Inductive Plasma Discharge Modeling of a Micro Newton Radiofrequency Ionthruster (μ N-RIT) ROBERT HENRICH, CHRISTIAN HEILIGER, Justus-Liebig-University, I. Physikalisches Institut — Up to date challenging scientific space experiments like LISA to detect gravitational waves have high requirements especially for the thruster. One of the most promising thruster is the μ N-RIT developed at the University of Giessen. This type uses an inductive plasma discharge and an extraction grid system for accelerating the ions up to a few keV. Due to this the μ N-RIT fulfills the requirements of a wide range of thrust as well as the high precision of it. Also the magnitude of the power consumption is limited to about 10 W. This is slightly below of actually μ N-RIT values. To meet this limitation the plasma modeling is an absolutely essential tool. The typical gas pressure in such a system is about 0.1 Pa. As a consequence validity of fluid dynamics is not guaranteed and a Particle in Cell (PIC) method could be necessary. However, PIC causes an enormous calculation consumption. Therefore, we are performing both kinds. For the fluid modeling we use the “Comsol Multiphysics” tool and for the PIC modeling we are developing a three dimensional massive parallelized code using MPI for all parts of the simulation. We present our first simulation results. Moreover, we compare the results of both tools and show how far the fluid simulation differs from the PIC simulation.

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Date submitted: 14 Jun 2012

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