



THALES



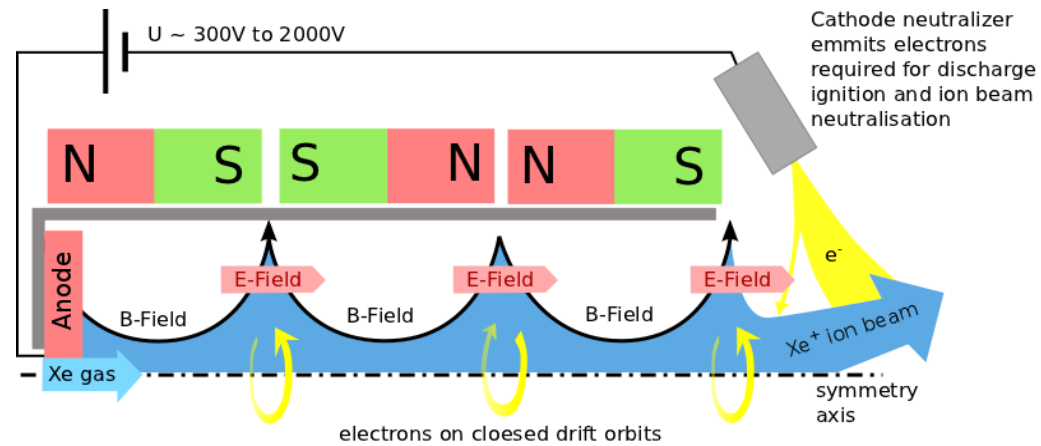
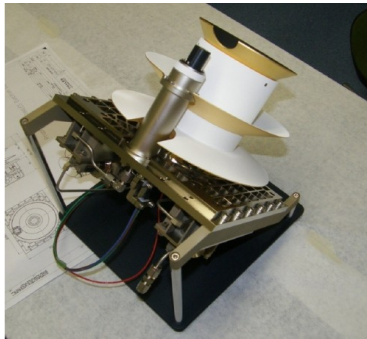
Particle Simulation of Ion thrusters

Julia Duras¹, Ralf Schneider¹, Konstantin Matyash¹, Oleksander Kalentev¹, Norbert Koch², Martin Schirra²

¹*Ernst-Moritz-Arndt University Greifswald, D-17487 Greifswald, Germany*

²*THALES Electron Devices GmbH, D-89077 Ulm, Germany*

High Efficiency Multistage Plasma Thruster HEMP-T

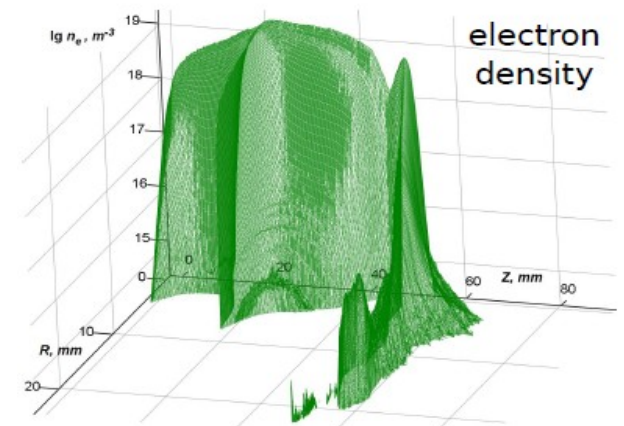
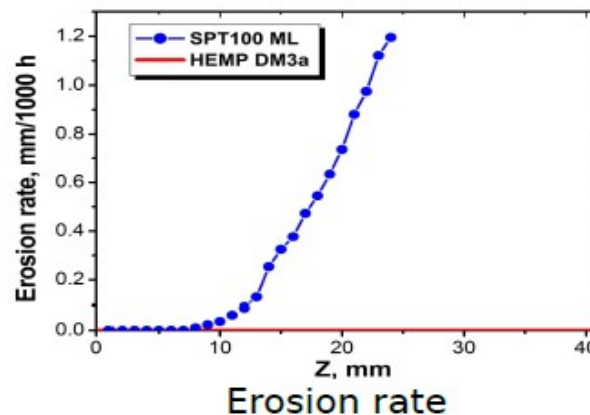


Simulation of:

Interaction with the walls

Plasma parameters

Particle-In-Cell
Method
(PIC)



Problems with terrestrial qualification

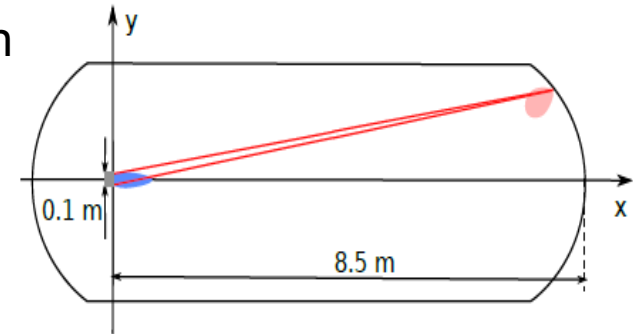


vacuum chamber at Aerospazio, Italy

Qualification for several 1000h

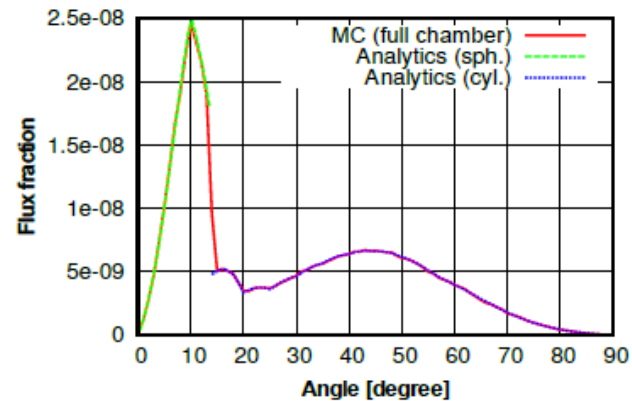
Interaction:

- plume with residual gas
- ions with vessel walls



⇒ **Artifacts in thrust & angular distribution**

Monte Carlo Simulation
&
Analytical Calculation



Returned particle flux fraction

Improvement:

Baffles reducing
back flow by
40% - 60%

Thank you!