1 Report

by Gullik Vetvik Killie, Add yourself

Abstract

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1.1 Introduction

- State of the art
- Why are we doing this
- What is being done
- Aims of report/study (want to see if)

We are using something to prove something!!!

1.2 Theory

1.3 Numerical Methods

- Short PiC (EMSES) explanation
- Experimental set up
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1.4 Results

- Comparison of cases with P-E and without
- Acc of charges at probes + ϕ, diff flows and α
- ϕ num vs ana

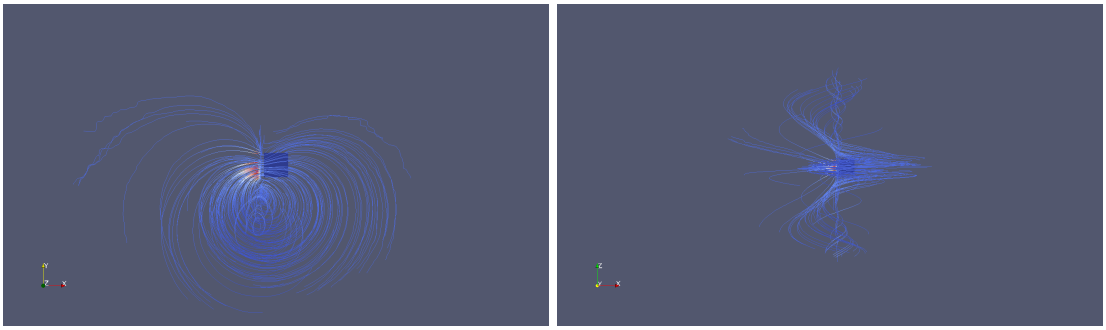

Figure 1.1: The trajectories of the electrons emmited by the photoelectric effect in simulation 6. It can be seen that some of the trajectories coincide with the volume occupied by the langmuir probes. The electrons are strongly affected by the magnetic field $\vec{B}$, and follows a gyrating path.

1.4.1 Induced electric current

The plasma is flowing in in relation to the coordinate system in the simulations. Due to this an induced electrical field, ε, will appear. To analyze the potential we want to correct for this potential field. The induced electrical field will neutralize the Lorentz force. Combined with the electrostatic approximation we can obtain the ε

$$\vec{\varepsilon} = \vec{v_D} \times \vec{B} \tag{1.1}$$

$$\int E dx = -\phi \tag{1.2}$$

$$\phi = -\int \vec{v}_d \times \vec{B} \approx -\int (41600\text{m/s} \cdot 50E - 6\text{T})\, dx \tag{1.3}$$

$$\phi = 2.08\text{x} \tag{1.4}$$

1.4.2 Photoemmision paths

1.5 Discussion

1.6 Conclusions

- Proposal for further studies (Probably see if photoemmision is relevant in tenous plasma (MEO CASE, magnetospheric tail lobes))