A Consistent Model of Plasma - The Potential in a Glass Box

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Overview

- About the Experiment
- Background
- Method
- Results
- Conclusion
About the Experiment

Schematic of Experiment with Glass Box

GEC Reference Cell
Background

Constant Debye Length

(150 mTorr, 60 V_{pp})

Varying Debye Length

(150 mTorr, 60 V_{pp})
Method

Calc. Potential ($\Phi$) on Walls

Calc. Charges on Walls ($Q$)

End of Loop? [No]

$\Phi = \sum_n \frac{k_e Q_n}{r_n} \cdot e^{\frac{r_n}{\lambda_p}}$

$n_i = \frac{n_{i,\text{fluid}v_0}}{\sqrt{\frac{2F_x}{m_i} \Delta x + \frac{2F_y}{m_i} \Delta y + \frac{2F_z}{m_i} \Delta z}} + 3v_0$

$E = -\nabla \Phi$

Generate Acceleration Maps

$n_e = n_0 e^{-\frac{q_e \Phi}{k_b T_e}}$

$\frac{1}{\lambda_D} = \sqrt{\frac{q_i^2 n_i}{\varepsilon_0 k_b T_i} + \frac{q_e^2 n_e}{\varepsilon_0 k_b T_e}}$

End of Loop? [Yes]

Generate Acceleration Maps
Results
Conclusion

More data is needed to progress

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