

CBET lol

Philip Moloney

**Imperial College
London**

January 2023

Submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy of Imperial College London

Department of Physics
Imperial College London
Prince Consort Road
London SW7 2AZ

Declaration

I hereby certify that the material of this thesis, which I now submit for the award of Doctor of Philosophy, is entirely my own work unless otherwise cited or acknowledged within the body of text.

Philip Moloney

January 2024

Copyright

The copyright of this thesis rests with the author. Unless otherwise indicated, its contents are licensed under a Creative Commons Attribution-Non Commercial 4.0 International Licence (CC BY-NC).

Under this licence, you may copy and redistribute the material in any medium or format. You may also create and distribute modified versions of the work. This is on the condition that: you credit the author and do not use it, or any derivative works, for a commercial purpose.

When reusing or sharing this work, ensure you make the licence terms clear to others by naming the licence and linking to the licence text. Where a work has been adapted, you should indicate that the work has been changed and describe those changes.

Please seek permission from the copyright holder for uses of this work that are not included in this licence or permitted under UK Copyright Law.

Abstract

Hi

Role of the Author

Acknowledgements

Contents

1	Introduction	15
2	Theory	16
3	Numerical Tools	17
4	Self-similar solutions to understand magnetised plasma transport	18
5	Fully kinetic simulations of a vacuum-plasma interface	19
6	A new implementation of the Hall effect in Gorgon	20
7	Conclusions	21
A	Numerics Appendices	23
	Bibliography	25
	Copyright Permissions	27

List of Tables

List of Figures

1 Introduction

2 Theory

3 Numerical Tools

4 Self-similar solutions to understand magnetised plasma transport

5 Fully kinetic simulations of a vacuum-plasma interface

6 A new implementation of the Hall effect in Gorgon

7 Conclusions

Appendices

A Numerics Appendices

Bibliography

Permissions