**REPORT PLAN**

**TITLE**: Simulating the charge on dust immersed in plasma

**ABTRSACT**:

**INTRODUCTION:**

* Introduce plasma (briefly)
* Introduce dust and why it is important to know the charge of the dust
* Problems that dust poses in practical uses of plasma such as:
* Fusion/TOKOMAK (contamination of central plasma + Reduction of fusion yield + Health risk)
* Semiconductor processing
* Why we are not using OM theory
* What our code will do

**BACKGROUND:**

* Plasma properties (pre-sheath and sheath formed around dust grain)
* Quasi-neutrality
* Debye length
* Debye-Hückle

**CHARGING THEORES:**

* Base assumptions used in our code:
* Spherical symmetry
* No collisions
* No magnetic field (B = 0)
* No thermionic emission ==> negatively charged dust
* Steady state ==> Ion current + electron current = 0 at the dust particle
* Quasi-neutrality
* OML Family/ABR
* Additional assumptions
* Theory and main equations
* Graphs that we have made in order to test validity against existing papers

**ANALYSIS AND RESULTS:**

* Comparison between OML and ABR in the small theta limit
* Comparison between MOML, ABR and Planar limit in small theta limit
* SOML/SMOML vs. upsilon
* Talk about our code’s capabilities

**CONCLUSION:**

**EXTENSIONS:**

* Flowing ABR
* B-fields
* Coulomb collisions
* Thermionic emission

**REFERNECES/ACKNOWLEDGMENTS:**

* Willis’ Thesis
* Thomas’ Thesis
* Allen and Kennedy: ABR and OML papers
* Michael Coppins (Planar potential equations – we need a source)