## CONTENTS

### CHAPTER I
**INTRODUCTION**

1.1. PLASMA CONFINEMENT  
1.2. IMPORTANCE OF PARTICLE TRAJECTORY ANALYSIS  
1.3. LITERATURE SURVEY  
   1.3.1. Cusped magnetic field geometry  
   1.3.2. End plugging  
1.4. SCOPE OF WORK  
1.5. REFERENCES  

### CHAPTER II
**MATHEMATICAL MODEL AND BASIC EQUATIONS**

2.1. BASIC THEORY  
2.2. MATHEMATICAL MODEL  
2.3. BASIC EQUATIONS  
2.4. METHODOLOGY  
REFERENCES  

### CHAPTER III
**FORCE ON A POSITIVE ION**

3.1 INTRODUCTION  
3.2 RESULTS  
   3.2.1. Effect of magnetic field (B)  
   3.2.2. Effect of applied electrostatic potential $\Phi_A$  
   3.2.3. Effect of location of injection point ($z_0$)  
   3.2.4. Effect of injection velocity $v_0$  
   3.2.5. Effect of initial azimuthal component of velocity $v_{0\phi}$  
   3.2.6. Effect of $B$ and $\Phi_A$ on components of $F_\parallel$  
3.3 DISCUSSION  
3.4 CONCLUSION  
REFERENCES  

### CHAPTER IV
**DEPTH OF PENETRATION OF THE PARTICLE**

4.1. INTRODUCTION  
4.2. INITIAL VELOCITY  
4.3. INITIAL AZIMUTHAL COMPONENT OF VELOCITY  
4.4. INTENSITY OF MAGNETIC FIELD  

CHAPTER V

TRAJECTORY OF A POSITIVE ION

5.1. INTRODUCTION

5.2. RESULTS OF TRAJECTORY IN THE ABSENCE OF THE APPLIED POTENTIAL ($\Phi_A$)
   5.2.1. Trajectory as a function of location of injection point ($z_0$).
   5.2.2. Trajectory as a function of intensity of magnetic field ($B$).
   5.2.3. Trajectory as a function of initial azimuthal component of velocity ($v_{\phi_0}$).
   5.2.4. Trajectory as a function of injection velocity ($v_0$).
   5.2.5. Trajectory as a function of pitch angle ($\theta$).

5.3. RESULTS OF TRAJECTORY WITH APPLIED POTENTIAL ($\Phi_A$)
   5.3.1. Trajectory as a function of location of injection point ($z_0$).
   5.3.2. Trajectory for selected values of $v_0$.
   5.3.3. Trajectories for selected values of intensity of magnetic field $B$.
   5.3.4. Trajectory of reflected particle for different electrostatic potentials

5.4. DISCUSSION

5.5. CONCLUSION

REFERENCES

CHAPTER VI

SUMMARY

APPENDIX I. Nomenclature

APPENDIX II. Runge – Kutta method

APPENDIX III. Flow chart and computer program
   List of publications