

Physics of collisional plasmas : introduction to high-frequency discharges

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Abstrak

This text is an introduction to the physics of collisional plasmas, as opposed to plasmas in space. It is intended for graduate students in physics and engineering . The first chapter introduces with progressively increasing detail, the fundamental concepts of plasma physic. The motion of individual charged particles in various configurations of electric and magnetic fields is detailed in the second chapter while the third chapter considers the collective motion of the plasma particles described according to a hydrodynamic model. The fourth chapter is most original in that it introduces a general approach to energy balance, valid for all types of discharges comprising direct current(DC) and high frequency (HF) discharges, including an applied static magnetic field. The basic concepts required in this fourth chapter have been progressively introduced in the previous chapters. The text is enriched with approx. 100 figures, and alphabetical index and 45 fully resolved problems. Mathematical and physical appendices provide complementary information or allow to go deeper in a given subject.