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Autore	Lieberman M. A (Michael A.)
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Nota di contenuto	PRINCIPLES OF PLASMA DISCHARGES AND MATERIALS PROCESSING; CONTENTS; PREFACE; PREFACE TO THE FIRST EDITION; SYMBOLS AND ABBREVIATIONS; PHYSICAL CONSTANTS AND CONVERSION FACTORS; PRACTICAL FORMULAE; 1 INTRODUCTION; 1.1 Materials Processing; 1.2 Plasmas and Sheaths; Plasmas; Sheaths; 1.3 Discharges; Radio Frequency Diodes; High-Density Sources; 1.4 Symbols and Units; 2 BASIC PLASMA EQUATIONS AND EQUILIBRIUM; 2.1 Introduction; 2.2 Field Equations, Current, and Voltage; Maxwell's Equations; 2.3 The Conservation Equations; Boltzmann's Equation; Macroscopic Quantities; Particle Conservation Momentum ConservationEnergy Conservation; Summary; 2.4 Equilibrium Properties; Boltzmann's Relation; Debye Length; Quasi-neutrality; Problems; 3 ATOMIC COLLISIONS; 3.1 Basic Concepts; Elastic and Inelastic Collisions; Collision Parameters; Differential Scattering Cross Section; 3.2 Collision Dynamics; Center-of-Mass Coordinates; Energy Transfer; Small Angle Scattering; 3.3 Elastic Scattering; Coulomb

Collisions; Polarization Scattering; 3.4 Inelastic Collisions; Atomic Energy Levels; Electric Dipole Radiation and Metastable Atoms; Electron Ionization Cross Section
Electron Excitation Cross Section Ion-Atom Charge Transfer; Ion-Atom Ionization; 3.5 Averaging Over Distributions and Surface Effects; Averaging Over a Maxwellian Distribution; Energy Loss per Electron-Ion Pair Created; Surface Effects; Problems; 4 PLASMA DYNAMICS; 4.1 Basic Motions; Motion in Constant Fields; $E \times B$ Drifts; Energy Conservation; 4.2 Nonmagnetized Plasma Dynamics; Plasma Oscillations; Dielectric Constant and Conductivity; Ohmic Heating; Electromagnetic Waves; Electrostatic Waves; 4.3 Guiding Center Motion; Parallel Force; Adiabatic Constancy of the Magnetic Moment
Drift Due to Motion Along Field Lines (Curvature Drift) Drift Due to Gyration (Gradient Drift); Polarization Drift; 4.4 Dynamics of Magnetized Plasmas; Dielectric Tensor; The Wave Dispersion; 4.5 Waves in Magnetized Plasmas; Principal Electron Waves; Principal Waves Including Ion Dynamics; The CMA Diagram; 4.6 Wave Diagnostics; Interferometer; Cavity Perturbation; Wave Propagation; Problems; 5 DIFFUSION AND TRANSPORT; 5.1 Basic Relations; Diffusion and Mobility; Free Diffusion; Ambipolar Diffusion; 5.2 Diffusion Solutions; Boundary Conditions; Time-Dependent Solution
Steady-State Plane-Parallel Solutions Steady-State Cylindrical Solutions; 5.3 Low-Pressure Solutions; Variable Mobility Model; Langmuir Solution; Heuristic Solutions; 5.4 Diffusion Across a Magnetic Field; Ambipolar Diffusion; 5.5 Magnetic Multipole Confinement; Magnetic Fields; Plasma Confinement; Leak Width w ; Problems; 6 DIRECT CURRENT (DC) SHEATHS; 6.1 Basic Concepts and Equations; The Collisionless Sheath; 6.2 The Bohm Sheath Criterion; Plasma Requirements; The Presheath; Sheath Potential at a Floating Wall; Collisional Sheaths; Simulation Results; 6.3 The High-Voltage Sheath Matrix Sheath

Sommario/riassunto

A Thorough Update of the Industry Classic on Principles of Plasma Processing
The first edition of Principles of Plasma Discharges and Materials Processing, published over a decade ago, was lauded for its complete treatment of both basic plasma physics and industrial plasma processing, quickly becoming the primary reference for students and professionals. The Second Edition has been carefully updated and revised to reflect recent developments in the field and to further clarify the presentation of basic principles. Along with in-depth coverage of the fundamentals of plasma physics

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