CONTENTS

MOTION OF CHARGED PARTICLES IN ELECTROMAGNETIC FIELDS IN THE DRIFT APPROXIMATION
by D. V. Sivukhin 1

§ 1. Motion of a Charged Particle in a Constant Uniform Magnetic Field 1
§ 2. Motion of the Guiding Center 6
§ 3. Origin of the Drifts 23
§ 4. Smoothing and Averaging of Quantities Containing Rapidly Varying Terms 33
§ 5. Complete System of Equations of Motion in the Drift Approximation 37
§ 6. More Exact System of Equations of Motion in the Drift Approximation 42
§ 7. Derivation of Certain Auxiliary Relations 47
§ 8. Derivation of a Compatible System of Equations of Motion in the Drift Approximation 63
§ 9. Another Approach to the Equation of Motion of the Guiding Center 68
§10. Examples 70
§11. Drift Integrals of the Motion in Constant Electric and Magnetic Fields 91
§12. Liouville Theorem in the Drift Approximation 96
§13. Extension of Drift Theory to the Case of Strong Transverse Electric Fields 100
References 104

PARTICLE INTERACTIONS IN A FULLY IONIZED PLASMA
by B. A. Trubnikov 105

I. Test Particles in a Plasma

§ 1. Force of Friction Due to Scattering in a Coulomb Field 105
§ 2. Coulomb Logarithm and the Role of Remote Interactions 108
§ 3. Average Force Acting on a Particle in a Plasma 111
§ 4. Test Particles in a Plasma 115
§ 5. Rate of Change of the Moments 118
§ 6. Characteristic Features of the Coulomb Interaction. The Potential Functions ψ and φ 122

§ 7. Use of the Scattering Cross Sections 126

II. Kinetic Equation for Coulomb Particles

§ 8. Motion of Particles in Phase Space 137
§ 9. Expression for the Flux 140
§10. Force of Dynamical Friction and the Diffusion Tensor 143
§11. Kinetic Equation for the Coulomb Interaction 148
§12. Kinetic Equation Taking Account of Polarization of the Medium 152

III. Kinetic Effects in High-Temperature Plasmas

§13. Test Particle in a Medium of Infinitely Heavy Field Particles at Rest 167
§14. Solution of the Kinetic Equation for the Preceding Case: "Basic" Relaxation Time 172
§15. Spherically Symmetric Distribution of Field Particles 174
§16. Runaway Electrons 180
§17. Maxwellian Distribution of Field Particles. Relaxation Time . 183
§18. Plane Flux in an Equilibrium Plasma 188
§19. Energy Transfer 192
§20. Approach to Equilibrium in a Two-Component Plasma 197
References 204

TRANSPORT PROCESSES IN A PLASMA
by S. I. Braginskii 205

§ 1. Transport Equations 205
§ 2. Transport Equations for a Simple Plasma (Summary of Results). 213
§ 3. Kinetics of a Simple Plasma (Qualitative Description) 219
§ 4. Kinetics of a Simple Plasma (Quantitative Analysis) 236
§ 5. Certain Paradoxes 255
§ 6. Hydrodynamic Description of a Plasma 262
§ 7. Multicomponent Plasma 276
§ 8. Examples 291
Appendix 310
References 311

THERMODYNAMICS OF A PLASMA
by A. A. Vedenov 312

§ 1. Classical Coulomb System 312
§ 2. Quantum Coulomb System 321
§ 3. Degree of Ionization of a Plasma 325