	35
	\$4

CONTENTS

THEORY OF OSCILLATIONS AND STABILITY OF A SEMICONDUCTOR PLASMA WITH LOW CARRIER DENSITY IN A STRONG ELECTRIC FIELD

R. R. Kikvidze and A. A. Rukhadze

Introduction	1
Chapter I. Homogeneous Semiconductor Plasma in a Strong Electric Field 1.1. Physical Meaning of the Instability Associated with a	5
Negative Current-Voltage Characteristic	5
1.2. Basic Equations Describing a Seminconductor Plasma with	0
Low Carrier Density 1.3. Oscillation Spectra of a Homogeneous Semiconductor	8
Plasma in a Strong Electric Field	11
1.4. Effect of Diffusion on the Instability of a Semiconductor	
Plasma with Negative Current-Voltage Characteristic	20
Chapter II. Spatially Inhomogeneous Solid-State Plasma in External Fields	25
2.1. Equation of Small Oscillations of an Inhomogeneous Plasma	0.5
with Low Carrier Density 2.2. Spectrum of Short-Wave Oscillations of an Inhomogeneous	25
Solid-State Plasma	28
2.3. Surface Waves in a Solid-State Plasma in the Absence of a	
Magnetic Field	30
2.4. Surface Waves in a Bounded Magnetized Plasma with Current Literature Cited	33 35
Literature Cited	33
NONLINEAR THEORY OF THE INTERACTION OF WAVES IN A PLASMA V. V. V. Pustovalov and V. P. Silin	
Preface	37
Notation	38
Introduction	41
Chapter I. Fundamentals of the Nonlinear Electrodynamics of a Medium	D-107534
with Time and Spatial Dispersion	42
 The Electromagnetic Field Equations and the Material Equation Multi-Index Permittivity Tensors and Truncated Equations 	42
of the Electromagnetic Field	45
3. Averaging of the Truncated Equations of the Electromagnetic Field	
with Respect to the Statistical Ensemble	49
4. Discussion of Results. Equation for the Frequencies of Interacting	
Electromagnetic Waves	55

viii

Chapter II. Multi-Index Permittivity Tensors of a Homogeneous Isotropic Plasma 5. Solution of the Kinetic Equation for an Isotropic Plasma as a Power	57
Series in the Self-Consistent Field 6. Permittivity Tensor of an Isotropic Plasma as the Simplest Example of the Multi-Index Tensor ϵ_{ij1jn} for $n = 1$. Spectra and Polarization of	59
the Characteristic Oscillations of an Isotropic Plasma	64
7. Three-Index Tensor $S_{ijs}(\omega, k; \omega', k')$ in an Isotropic Plasma	74
8. The Four-Index Tensor V_{iajb} (ω , k ; ω ', k ') in an Isotropic Plasma	84
Chapter III. Examples of Nonlinear Processes in an Isotropic Plasma	89
9. Nonlinear Interaction of Longitudinal Oscillations of an Isotropic Plasma 10. Nonlinear Interaction of Longitudinal and Transverse Oscillations in	91
an Isotropic Plasma	108
11. Nonlinear Interaction of Transverse Characteristic Oscillations of an	
Isotropic Plasma	116
12. Effective Cross Sections of Various Scattering Processes in an	
Isotropic Plasma	121
13. Corrections to the Spectra of the Characteristic Oscillations of	
an Isotropic Plasma due to Nonlinear Interaction	127
14. Nonlinear Interaction of Characteristic Oscillations of a Plasma	
and the Theory of the Scattering of Electromagnetic Waves on	100
Fluctuations of the Plasma	133
Chapter IV. Multi-Index Tensors of the Complex Permittivity	
of a Homogeneous Magnetoactive Plasma	140
15. Solution of the Transport Equation for a Magnetoactive Plasma	
in the Form of a Power Series in the Self-Consistent Electric Field	142
16. Permittivity Tensor of a Magnetoactive Plasma as the Simplest	E 423
Example of the Multi-Index Tensor for $n = 1$	149
17. The Inverse Tensor (3.17) and the Spectral Function of the Electric	1.50
Fields of the Characteristic Oscillations of a Magnetoactive Plasma	158
18. Quasilongitudinal Oscillations of a Magnetoactive Plasma. Spectra	166
and Spectral Functions	176
19. Three-Index Tensor $S_{ijs}(\omega, k; \omega', k')$ in a Magnetoactive Plasma	197
20. Four-Index Tensor V_{iajb} (ω , k; ω ', k') in a Magnetoactive Plasma 21. Conservation Laws in the Nonlinear Interaction of Plasma Oscillations	131
as a Consequence of the Symmetry of the Multi-Index Tensors	203
ab a combequence of the symmetry of the matter mach removes	
Chapter V. Specific Nonlinear Processes in a Magnetoactive Plasma 22. Decay of Quasilongitudinal Characteristic Oscillations of an	209
Isothermal Magnetoactive Plasma	210
23. Decay of Quasilongitudinal Characteristic Oscillations of a	015
Nonisothermal Magnetoactive Plasma	215
24. Induced Combination Scattering of High-Frequency Transverse	220
Waves in a Cold Magnetoactive Plasma 25. Induced Scattering of Low-Frequency Quasilongitudinal	220
Characteristic Oscillations of Magnetoactive Plasma on the Plasma Particles	222
26. Induced Scattering of Quasilongitudinal Characteristic Cyclotron Oscillations	
of a Magnetoactive Plasma on the Plasma Particles	233
or a magnetoactive reading on the reading randers	
Conclusions	240
Appendix. Multi-Index Complex Permittivity Tensors of a Cold	0.41
Plasma in the Framework of the Hydrodynamic Description	241
Literature Cited	252