

1. Record Nr.	UNINA9910822759903321
Autore	Shvartsburg A. B (Aleksandr Borisovich)
Titolo	Waves in gradient metamaterials // Alexander B. Shvartsburg, Russian Academy of Sciences, Russia, Alexei A. Maradudin, The University of California, Irvine, USA
Pubbl/distr/stampa	[Hackensack] N.J., : World Scientific, c2013 New Jersey : , : World Scientific, , [2013] 2013
ISBN	1-299-46263-4 981-4436-96-8
Descrizione fisica	1 online resource (x, 328 pages) : illustrations
Collana	Gale eBooks
Disciplina	620.1/1
Soggetti	Metamaterials Nanostructures Nanophotonics Dielectrics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	CONTENTS; 1. Introduction; Bibliography; 2. Non-local Dispersion of Heterogeneous Dielectrics; 2.1. Giant Heterogeneity-Induced Dispersion of Gradient Photonic Barriers; 2.2. Reflectance and Transmittance of Subwavelength Gradient Photonic Barriers: Generalized Fresnel Formulae; 2.3. Non-Fresnel Reflectance of Unharmonic Periodic Gradient Structures; Comments and Conclusions to Chapter 2; Bibliography; 3. Gradient Photonic Barriers: Generalizations of the Fundamental Model; 3.1. Effects of the Steepness of the Refractive Index Profile near the Barrier Boundaries on Reflectance Spectra 3.2. Asymmetric Photonic Barriers 3.3. Inverse Functions and Parametric Presentations - New Ways to Model the Photonic Barriers; Comments and Conclusions to Chapter 3; Bibliography; 4. Resonant Tunneling of Light Through Gradient Dielectric Nanobarriers; 4.1. Transparency Windows for Evanescent Modes: Amplitude - Phase Spectra of Transmitted Waves; 4.2. Energy Transfer in Gradient Media by

Evanescent Waves; 4.3. Weakly Attenuated Tunneling of Radiation Through a Subwavelength Slit, Confined by Curvilinear Surfaces; Comments and Conclusions to Chapter 4; Bibliography

5. Interaction of Electromagnetic Waves with Continuously Structured Dielectrics 5.1. Reflectance/Transmittance Spectra of Lossy Gradient Nanostructures; 5.2. Interplay of Natural and Artificial Dispersion in Gradient Coatings; 5.3. EM Radiation in Gradient Superlattices; Comments and Conclusions to Chapter 5; Bibliography; 6. Polarization Phenomena in Gradient Nanophotonics; 6.1. Wideangle Broadband Antireflection Coatings; 6.2. Polarization-Dependent Tunneling of Light in Gradient Optics; 6.3. Reflectionless Tunneling and Goos-Hanchen Effect in Gradient Metamaterials

Comments and Conclusions to Chapter 6 Bibliography; 7. Gradient Optics of Guided and Surface Electromagnetic Waves; 7.1. Narrow-Banded Spectra of S-polarized Guided Electromagnetic Waves on the Surface of a Gradient Medium: Heterogeneity-Induced Dispersion; 7.1.1. $0 < \epsilon < \epsilon_0$; 7.2. Surface Electromagnetic Waves on a Curvilinear Interface: Geometrical Dispersion; 7.3. Surface Electromagnetic Waves on Rough Surfaces: Roughness-Induced Dispersion; 7.3.1. Periodically corrugated surfaces; 7.3.2. A randomly rough surface; Comments and Conclusions to Chapter 7; Bibliography

8. Non-local Acoustic Dispersion of Gradient Solid Layers 8.1. Gradient Acoustic Barrier with Variable Density: Reflectance/Transmittance Spectra of Longitudinal Sound Waves; 8.2. Heterogeneous Elastic Layers: "Auxiliary Barrier" Method; 8.3. Double Acoustic Barriers: Combined Effects of Gradient Elasticity and Density; Comments and Conclusions to Chapter 8; Bibliography; 9. Shear Acoustic Waves in Gradient Elastic Solids; 9.1. Strings with Variable Density; 9.2. Torsional Oscillations of a Graded Elastic Rod; 9.3. Tunneling of Acoustic Waves Through a Gradient Solid Layer

Comments and Conclusions to Chapter 9

Sommario/riassunto

This book opens a new avenue to an engendering field of applied physics, located at the "crossing" of modern photonics, electromagnetics, acoustics and material science. It also highlights the concept of "non-locality", which proves to be not a special feature of quantum phenomena, but is shown to have an important counterpart in classical physics and its engineering applications too. Furthermore, it visualizes the physical results by means of simple analytical presentations, reduced sometimes to the elementary functions.
