Nonlinear Acoustic Waves in Micro-inhomogeneous Solids
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DESCRIPTION

Nonlinear Acoustic Waves in Micro-inhomogeneous Solids covers the broad and dynamic branch of nonlinear acoustics, presenting a wide variety of different phenomena from both experimental and theoretical perspectives.

The introductory chapters, written in the style of graduate-level textbook, present a review of the main achievements of classic nonlinear acoustics of homogeneous media. This enables readers to gain insight into nonlinear wave processes in homogeneous and micro-inhomogeneous solids and compare it within the framework of the book.

The subsequent eight chapters covering: Physical models and mechanisms of the structure nonlinearity of micro-inhomogeneous media with cracks and cavities; Elastic waves in media with strong acoustic nonlinearity; Wave processes in micro-inhomogeneous media with hysteretic nonlinearity; Wave processes in nonlinear micro-inhomogeneous media with relaxation; Wave processes in the polycrystalline solids with dissipative and elastic nonlinearity caused by dislocations; Experimental studies of the nonlinear acoustic phenomena in polycrystalline rocks and metals; Experimental studies of nonlinear acoustic phenomena in granular media; and Nonlinear phenomena in seismic waves are dedicated to the theoretical and experimental research of nonlinear processes, caused by longitudinal elastic waves propagation and interaction in the micro-inhomogeneous media with a strong acoustical nonlinearity of different types (elastic, hysteretic, bimodular, elastic quadratic and non-elastic).

This valuable monograph is intended for graduate students and researchers in applied physics, mechanical engineering, and applied mathematics, as well as those working in a wide spectrum of disciplines in materials science.