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Nota di contenuto	Acoustic Microscopy; Contents; Foreword; Preface; Introductory Comments; Introduction; 1 Scanning Acoustic Microscopy. Physical Principles and Methods. Current Development; 1.1 Basics of Acoustic Wave Propagation in Condensed Media; 1.2 Physical Principles of Scanning Acoustic Microscopy; 1.3 Acoustic Imaging Principles and Quantitative Methods of Acoustic Microscopy; 1.4 Methodological Limitations of Acoustic Microscopy; 2 Acoustic Field Structure in a Lens System of a Scanning Acoustic Microscope 2.1 Calculation of the Focal Area Structure with Due Regard for Aberrations and Absorption in a Medium2.2 The Field of a Spherical Focusing Transducer with an Arbitrary Aperture Angle; 2.3 Analysis of Acoustic Field Spatial Structure with a Spherical Acoustic Transducer; 2.4 Experimental Study of the Focal Area Structure of a Transmission Acoustic Microscope; 2.5 Formation of a Focused Beam of Bulk Acoustic Waves by a Planar System of Transducers; 2.6 About the Possibility of Using Scholte-Stoneley Waves for Surface Waves' Acoustic Microscopy 3 Output Signal Formation in a Transmission Raster Acoustic Microscope3.1 Outline of the Problem; 3.2 Transmission Acoustic Microscope: Formation of the Output Signal as a Function of Local

Properties of Flat Objects. General Concepts; 3.3 General Representation of the Output Signal of the Transmission Acoustic Microscope; 3.4 Formation of the A(z) Dependence for Objects with a Small Shear Modulus; 4 Quantitative Acoustic Microscopy Based on Lateral Mechanical Scanning; 4.1 Methods of Quantitative Ultrasonic Microscopy with Mechanical Scanning: Review
4.2 Ray Models of V (z) and V (x) QSAM Systems4.3 Wave Theory of V (z) and V (x) QSAM Systems; 4.4 Angular Resolution of QSAM Systems; 4.5 Application of the V (x) QSAM System to LSAW Measurement; 4.6 Temperature Stability of the V (x) QSAM System; 5 Acoustic Microscopy and Nonlinear Acoustic Effects; 5.1 Nonlinear Acoustic Applications for Characterization of Material Microstructure; 5.1.1 Schematic of Experiment; 5.1.2 Visualization by Nonlinear Acoustic Methods; 5.1.3 Parametric Representation of Acoustic Nonlinearity
5.2 Peculiarities of Nonlinear Acoustic Effects in the Focal Area of an Acoustic Microscope5.3 Temperature Effects in the Focal Area of an Acoustic Microscope; 5.4 Effects of Radiation Pressure on Samples Examined with an Acoustic Microscope; 5.5 The Theory of Modulated Focused Ultrasound Interaction with Microscopic Entities; 5.5.1 Shell Model of a Cell; 5.5.2 Interaction of a Cell with a High-Frequency Field within the Framework of the Shell Model. Equation for the Radiation Force; 5.5.3 Oscillations of a Microparticle under the Action of a Nonlinear Force
6 Investigation of the Local Properties and Microstructure of Model Systems and Composites by the Acoustic Microscopy Methods

Sommario/riassunto

This only and up-to-date monograph on this versatile method covers its use in a range of applications spanning the fields of physics, materials science, electrical engineering, medicine, and research and industry.Following an introduction, the highly experienced author goes on to investigate acoustic field structure, output signal formation in transmission raster acoustic microscopes and non-linear acoustic effects. Further chapters deal with the visco-elastic properties and microstructure of the model systems and composites used, as well as polymer composite materials and the microstructu