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Nota di contenuto	Chapter 1. History of Nonlinear Acoustics: 1750s 1930s -- Chapter 2. The Parameter B/A -- Chapter 3. Model Equations -- Chapter 4. Progressive Waves in Lossless and Lossy Fluids -- Chapter 5. Dispersion -- Chapter 6. Radiation Pressure and Acoustic Levitation -- Chapter 7. Acoustic Streaming -- Chapter 8. Sound Beams -- Chapter 9. Finite-Amplitude Waves in Solids -- Chapter 10. Perturbation Methods -- Chapter 11. Computational Methods -- Chapter 12. Propagation in Inhomogeneous Media (Ray Theory) -- Chapter 13. Statistical Phenomena -- Chapter 14. Parametric Layers, Four-Wave Mixing, and Wave-Front Reversal -- Chapter 15. Biomedical Applications.

Sommario/riassunto

This open access book is an introductory text on the theory of nonlinear acoustics authored by experts on their respective topics. It is written at a level appropriate for a graduate course on nonlinear acoustics, and it also serves as a useful resource for scientists and engineers. Consistent notation is employed for the principal symbols, and there is extensive cross-referencing between chapters. Chapters 1 through 8 develop the physical concepts, mathematical models, and classical methods of solution that form the theoretical framework for nonlinear acoustics. These chapters, or selected portions, form an appropriate core for an introductory course. While the emphasis is on nonlinear sound waves in fluids, Chapter 9 provides an introduction to nonlinear elastic waves in isotropic solids. Chapters 10 through 15 cover applications and additional methodologies encountered in nonlinear acoustics that include perturbation and numerical methods, ray theory for inhomogeneous moving media, statistical and parametric phenomena, and biomedical applications. The book is relevant to studies of therapeutic ultrasound, blast waves and jet noise, nondestructive testing, parametric array loudspeakers, particle manipulation with acoustic radiation force, and other applications involving nonlinear acoustics. This is an open access book. .