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Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	I Introduction -- I.1 What is ultrasound? -- I.2 A few historical remarks -- I.3 Ultrasound in the living world -- I.4 Upper frequency limit of sound -- II Basic Concepts of Acoustics -- II.1 Sound fields and the physical quantities describing them -- II.2 Sound propagation in gases and liquids -- II.3 Sound waves in solids -- II.4 Reflection and refraction -- II.5 Doppler effect -- III Sound Radiation and Sound Diffraction -- III.1 Signals in time and frequency representation, linear systems -- III.2 The principle of point source synthesis, the moving piston -- III.3 Radiation from a circular piston -- III.4 Piston with non-uniform surface velocity -- III.5 Diffraction and scattering -- IV Generation of Ultrasound—Part I -- IV.1 The piezoelectric effect -- IV.2 Piezoelectric materials -- IV.3 Basic piezoelectric equations, electro-mechanical coupling factor -- IV.4 Dynamic characteristics of piezoelectric transducers operated in their thickness mode -- IV.5 Mechanical and electrical equivalent circuit of a piezoelectric transducer near its resonance -- IV.6 Practical design of piezoelectric ultrasound generators -- V Generation of Ultrasound—Part II -- V.1 Composite piezoelectric transducers -- V.2 Piezoelectric bending transducers -- V.3 Generation of high frequency ultrasound -- V.4 Concentration of ultrasound by focusing -- V.5 Generation of high vibrational amplitudes -- V.6 Generation of shear waves and Rayleigh waves -- V.

7 Magnetostrictive generation of ultrasound -- V.8 Electrostatic ultrasound generators -- V.9 Mechanical methods -- VI Detection and Measurement of Ultrasound -- VI.1 Detection of ultrasound with extended piezo transducers, reciprocity -- VI.2 Electrostatic receivers -- VI.3 Ultrasound microphones, calibration -- VI.4 Mechanical detection -- VI.5 Thermal ultrasound detectors -- VI.6 Diffraction of light by ultrasound waves -- VI.7 Visualization of ultrasound -- VII Generation and Detection of Sound with Frequencies above 1 GHz (Hypersound) -- VII.1 Coherent methods for the generation and detection of hypersound -- VII.2 Phonons (sound quanta) in solids -- VII.3 Quantum acoustical interpretation of some effects of ultrasound -- VII.4 Generation of hypersound with heat pulses -- VII.5 Detection of hypersound with superconducting bolometers -- VII.6 Generation and detection of incoherent hypersound with superconducting tunnel contacts -- VII.7 Detection of ‘natural’ hypersound -- VIII Absorption of Ultrasound -- VIII. 1 Classical sound absorption in gases and liquids -- VIII.2 Molecular sound absorption in gases -- VIII.3 Sound absorption in liquids -- VIII.4 Sound absorption in solids -- VIII.5 Experimental methods for the determination of sound velocity and attenuation in the ultrasonic range -- IX Applications in Signal Processing and Measuring Techniques -- IX. 1 Ultrasonic delay lines -- IX.2 Rayleigh wave filters -- IX.3 Light modulation and light deflection -- IX.4 Other small-signal applications -- X Non-destructive Testing of Materials -- X.1 Survey of various testing methods -- X.2 Impulse echo method -- X.3 Frequencies and wave types -- X.4 Transducers for flaw detection -- X.5 Types of display -- X.6 Suitability of materials for testing -- X.7 Practical examples of ultrasonic flaw detection -- XI Application of Ultrasound in Medical Diagnostics -- XI.1 Acoustic properties of biological tissue -- XI.2 Impulse echo method -- XI.3 Typical applications of the impulse echo method in sonography -- XI.4 Doppler sonography -- XII Special Methods of Ultrasonic Imaging -- XII.1 Ultrasonic microscopy -- XII.2 Acoustic holography -- XII.3 Ultrasonic tomography -- XIII Cavitation -- XIII.1 Basic types of sonically induced cavitation -- XIII.2 Dynamics of a single cavity -- XIII. 3 Cavitation nuclei and cavitation thresholds -- XIII.4 Real cavitation and some effects caused by it -- XIV Applications of High Intensity Ultrasound -- XIV.1 Ultrasonic cleaning -- XIV.2 Joining with ultrasound -- XIV.3 Machining -- XIV.4 Production of dispersions -- XIV.5 Further applications -- XIV.6 Medical therapy -- XV On the Possibility of Health Risks Caused by Ultrasound -- XV.1 Damage to tissue caused by diagnostic ultrasound -- XV.2 Damage caused by airborne ultrasound -- Notation.

Sommario/riassunto

This book is a translation of 'Physik und Technik des Ultraschalls', originally published in 1988 by S. Hirzel Verlag, Stuttgart. As in the German edition, it is based on lectures on ultrasound which the author has given over the past fifteen years to students of electrical engineering and physics at the Rheinisch-Westfiilische Technische Hochschule Aachen, Germany. Its purpose is to explain and describe the peculiarities of high frequency sound with general acoustics as a foundation. It is these peculiarities which have led to the development of specific methods of sound generation and sound detection on the one hand and are relevant to the way ultrasound propagates in various materials, and which are the origin of a wide range of technical applications on the other. The first part of the book is devoted to the fundamentals of ultrasonics. Since the reader is not expected to have a knowledge of general acoustics, introductory chapters survey the basic ideas and laws of acoustics without systematically deriving the formulae pre- sented. Likewise, the third chapter, which deals with the

	radiation and diffraction of sound, is still fairly general, although it is somewhat more adapted to the specific requirements of ultrasound. In the three subsequent chapters, the generation and detection or measurement of ultrasound is dealt with. The seventh chapter is a digression on the peculiarities of the hypersonic range.

2. Record Nr. UNINA9910253989603321

Autore	Zhang Quansheng
Titolo	Automotive Air Conditioning : Optimization, Control and Diagnosis / / by Quansheng Zhang, Shengbo Eben Li, Kun Deng
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Descrizione fisica	1 online resource (VIII, 366 p. 162 illus., 139 illus. in color.)
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Soggetti	Transportation Automotive engineering Building construction Thermodynamics Heat engineering Heat - Transmission Mass transfer Automotive Engineering Building Physics, HVAC Engineering Thermodynamics, Heat and Mass Transfer
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Preface -- Section I: Model Development -- CFD-based Modeling of Heat Transfer in a Passenger Compartment -- Model Development for Air Conditioning System in Heavy Duty Trucks -- Aggregation-based Thermal Model Reduction -- Section II: Control -- Robust H Switching Control of Polytopic Parameter-Varying Systems via Dynamic Output Feedback -- Output Feedback Control of Automotive Air Conditioning

System using H Technique -- Improving Tracking Performance of Automotive Air Conditioning System via µSynthesis -- Mean-Field Control for Improving Energy Efciency -- Pseudospectral Optimal Control for Constrained Nonlinear Systems -- Section III: Optimization -- Multi-objective Supervisory Controller for Hybrid Electric Vehicles -- Energy-Optimal Control of an Automotive Air Conditioning System for Ancillary Load Reduction -- Storage Evaporator -- Cruising Control of Hybridized Powertrain for Minimized Fuel Consumption -- Section IV: Fault Diagnosis -- Fault Detection and Isolation with Applications to Vehicle Systems -- Fault Detection and Isolation of Automotive Air Conditioning Systems using First Principle Models -- Evaluating the Performance of Automated Fault Detection and Diagnosis Tools -- Index.

Sommario/riassunto

This book presents research advances in automotive AC systems using an interdisciplinary approach combining both thermal science, and automotive engineering. It covers a variety of topics, such as: control strategies, optimization algorithms, and diagnosis schemes developed for when automotive air condition systems interact with powertrain dynamics. In contrast to the rapid advances in the fields of building HVAC and automotive separately, an interdisciplinary examination of both areas has long been neglected. The content presented in this book not only reveals opportunities when interaction between on-board HVAC and powertrain is considered, but also provides new findings to achieve performance improvement using model-based methodologies.