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Disciplina	620.28
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	Vibration
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	Dynamics
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	Applied mathematics
	Engineering mathematics
	Characterization and Evaluation of Materials
	Vibration, Dynamical Systems, Control
	Ultrasound
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Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	From the Contents: Introduction -- Acoustic Field of a 1-D Array Element -- Large, Single Element Transducer Models -- Phased Array Beam Modeling (1-D Elements) -- Time Delay Laws (2-D) -- Acoustic Field of a 2-D Array Element -- Phased Array Beam Modeling (2-D Elements) -- Time Delay Laws (3-D) -- Linear System Models of Phased Arrays -- Phased Array System Functions -- Measurement Models for Ultrasonic Arrays -- Imaging with Phased Arrays - An Introduction -- Imaging Measurement Models -- Element Boundary Conditions and Other Modeling Issues -- Appendix A - The Beylkin Determinant -- Appendix B - Angle Area Ratios -- Appendix C - MATLAB® Functions

and Scripts -- Index.

Sommario/riassunto	This book describes in detail the physical and mathematical foundations of ultrasonic phased array measurements. The book uses linear systems theory to develop a comprehensive model of the signals and images that can be formed with phased arrays. Engineers working in the field of ultrasonic nondestructive evaluation (NDE) will find in this approach a wealth of information on how to design, optimize and interpret ultrasonic inspections with phased arrays. The fundamentals and models described in the book will also be of significant interest to other fields, including the medical ultrasound and seismology communities. A unique feature of this book is that it presents a unified theory of imaging with phased arrays that shows how common imaging methods such as the synthetic aperture focusing technique (SAFT), the total focusing method (TFM), and the physical optics far field inverse scattering (POFFIS) imaging method are all simplified versions of more fundamental and quantitative imaging approaches, called imaging measurement models. To enhance learning, this book first describes the fundamentals of phased array systems using 2-D models, so that the complex 3-D cases normally found in practice can be more easily understood. In addition to giving a detailed discussion of phased array systems, Fundamentals of Ultrasonic Phased Arrays also provides MATLAB® functions and scripts, allowing the reader to conduct simulations of ultrasonic phased array transducers and phased array systems with the latest modeling technology.