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Nota di contenuto	Materials and Acoustics Handbook; Table of Contents; Foreword; Preface; Part 1. Homogenous and Homogenous Stratified Media: Linear Model of Propagation; Chapter 1. Equations of Propagation; 1.1. Introduction; 1.1.1. Fluid medium; 1.1.2. Elastic solid; 1.2. Solutions of the propagative equation: monochromatic waves, plane waves; 1.2.1. Fluid medium or isotropic solid; 1.2.2. Anisotropic solid; 1.3. Bibliography; Chapter 2. Interaction of a Plane Wave and a Plane Interface; 2.1. Introduction; 2.1.1. Boundary conditions in acoustics 2.1.2. Plane interface separating two fluid or isotropic solid media2.1.3. Interface separating two anisotropic solid media; 2.2. Bibliography; Chapter 3. Propagation of Plane Waves in Multilayered Media; 3.1.

Introduction; 3.1.1. Propagation on a single material layer; 3.1.2. Propagation in a multilayered medium; 3.1.3. Propagation in a periodic multilayered medium; 3.2. Bibliography; Chapter 4. Propagation in Continuously Stratified Media; 4.1. Introduction; 4.2. Wave equation for 1D inhomogenous media; 4.2.1. Second-order differential system
4.2.2. First-order ordinary differential system for the case of 1Dinhomogenity4.3. Solution to the wave equation in 1D inhomogenous media; 4.3.1. The matricant; 4.3.2. Evaluation of the matricant by the Peano series; 4.4. Remarks on the numerical implementation; 4.4.1. The Peano series as a power series in dispersion parameters; 4.4.2. Examples; 4.5. Bibliography; Chapter 5. Modal Waves in Plane Structures; 5.1. Introduction; 5.1.1. General properties of modal waves in plane structures; 5.1.2. Usual modal waves; 5.1.3. Dispersion effects for modal waves
5.1.4. Generalized modal waves - pseudo modal waves5.1.5. A generic example; 5.2. Appendix: non-null elements of determinant D; 5.3. Bibliography; Part 2. Porous and Stratified Porous Media Linear Models of Propagation; Introduction to Part 2; Chapter 6. The Equivalent Fluid Model; 6.1. Introduction; 6.2. Geometry definitions; 6.2.1. Ideal fluid; 6.2.2. Thermoviscous fluids; 6.3. Bibliography; Chapter 7. Biot's Midel; 7.1. Introduction; 7.1.1. Perfect fluid and elastic solid; 7.1.2. Thermoviscous fluid and visco-elastic structure; 7.2. Bibliography Chapter 8. Propagation Equations in the Time Domain8.1. Introduction; 8.1.1. Materials: frequency and temporal approach; 8.1.2. Fractional derivative and behavior of materials; 8.1.3. Fractional derivative and viscoelasticity; 8.1.4. Fractional derivative and model of the equivalent fluid; 8.2. Inertial regime (high frequency approximation); 8.2.1. A semi-infinite medium; 8.2.2. Cases of a finite medium; 8.2.3. Reflection and transmission operators; 8.3. Viscous regime (low frequency approximation); 8.3.1. Resolution for the semi-infinite medium; 8.3.2. Solution in a finite medium
8.3.3. Reflection and transmission operators

Sommario/riassunto

Written by a group of acoustics and vibration specialists, this book studies the acoustic and vibrating phenomena that occur in diverse materials used for all kinds of purposes. The first part studies the fundamental aspects of propagation: analytical, numerical and experimental. The second part outlines industrial and medical applications. Covering a wide range of topics that associate materials science with acoustics, this will be of invaluable use to researchers, engineers, or practitioners in this field, as well as students in acoustics, physics, and mechanics.