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Nota di contenuto	Cover; Title Page; Contents; Preface; PART 1. MATHEMATICAL PRELIMINARIES, DEFINITIONS AND PROPERTIES OF FRACTIONAL INTEGRALS AND DERIVATIVES; Chapter 1. Mathematical Preliminaries; 1.1. Notation and definitions; 1.2. Laplace transform of a function; 1.3. Spaces of distributions; 1.4. Fundamental solution; 1.5. Some special functions; Chapter 2. Basic Definitions and Properties of Fractional Integrals and Derivatives; 2.1. Definitions of fractional integrals and derivatives; 2.1.1. Riemann-Liouville fractional integrals and derivatives 2.1.1.1. Laplace transform of Riemann-Liouville fractional integrals and derivatives 2.1.2. Riemann-Liouville fractional integrals and derivatives on the real half-axis; 2.1.3. Caputo fractional derivatives; 2.1.4. Riesz potentials and Riesz derivatives; 2.1.5. Symmetrized Caputo derivative; 2.1.6. Other types of fractional derivatives; 2.1.6.1. Canavati fractional derivative; 2.1.6.2. Marchaud fractional derivatives; 2.1.6.3. Grunwald-Letnikov fractional derivatives; 2.2. Some additional properties of

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Sommario/riassunto

The books Fractional Calculus with Applications in Mechanics: Vibrations and Diffusion Processes and Fractional Calculus with Applications in Mechanics: Wave Propagation, Impact and Variational Principles contain various applications of fractional calculus to the fields of classical mechanics. Namely, the books study problems in fields such as viscoelasticity of fractional order, lateral vibrations of a rod of fractional order type, lateral vibrations of a rod positioned on fractional order viscoelastic foundations, diffusion-wave phenomena, heat conduction, wave propagation, forced oscillations.