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Autore	Peube J.-L (Jean-Laurent)
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3.2.3. Mechanical system in thermodynamic equilibrium: the rigid solid3.2.4. The open mechanical system; 3.2.5. Thermodynamics of a system in motion; 3.3. Kinematics of continuous media; 3.3.1. Lagrangian and Eulerian variables; 3.3.2. Trajectories, streamlines, streaklines; 3.3.3. Material (or Lagrangian) derivative; 3.3.4. Deformation rate tensors; 3.4. Phenomenological laws of viscosity; 3.4.1. Definition of a fluid; 3.4.2. Viscometric flows; 3.4.3. The Newtonian fluid; Chapter 4. Fluid Dynamics Equations; 4.1. Local balance equations; 4.1.1. Balance of an extensive quantity G
4.1.2. Interpretation of an equation in terms of the balance equation4. 2. Mass balance; 4.2.1. Conservation of mass and its consequences; 4.2.2. Volume conservation; 4.3. Balance of mechanical and thermodynamic quantities; 4.3.1. Momentum balance; 4.3.2. Kinetic energy theorem; 4.3.3. The vorticity equation; 4.3.4. The energy equation; 4.3.5. Balance of chemical species; 4.4. Boundary conditions; 4.4.1. General considerations; 4.4.2. Geometric boundary conditions; 4.4.3. Initial conditions; 4.5. Global form of the balance equations; 4.5.1. The interest of the global form of a balance
4.5.2. Equation of mass conservation

Sommario/riassunto

This book examines the phenomena of fluid flow and transfer as governed by mechanics and thermodynamics. Part 1 concentrates on equations coming from balance laws and also discusses transportation phenomena and propagation of shock waves. Part 2 explains the basic methods of metrology, signal processing, and system modeling, using a selection of examples of fluid and thermal mechanics.