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Titolo	Introduction to simple shock waves in air : with numerical solutions using artificial viscosity // Sean Prunty
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Edizione	[Second edition.]
Descrizione fisica	1 online resource (XV, 344 p. 164 illus., 5 illus. in color.)
Collana	Shock Wave and High Pressure Phenomena
Disciplina	533.293
Soggetti	Shock waves
Lingua di pubblicazione	Inglese
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Nota di contenuto	Chapter 1. Brief outline of the equations of fluid flow -- Chapter 2. Waves of finite amplitude -- Chapter 3. Conditions across the shock: the Rankine-Hugoniot equations -- Chapter 4. Numerical treatment of plane shocks -- Chapter 5. Spherical shock waves: the self-similar solution -- Chapter 6. Numerical treatment of spherical shock waves.
Sommario/riassunto	This book provides an elementary introduction to one-dimensional fluid flow problems involving shock waves in air. The differential equations of fluid flow are approximated by finite difference equations and these in turn are numerically integrated in a stepwise manner, with artificial viscosity introduced into the numerical calculations in order to deal with shocks. This treatment of the subject is focused on the finite-difference approach to solve the coupled differential equations of fluid flow and presents the results arising from the numerical solution using Mathcad programming. Both plane and spherical shock waves are discussed with particular emphasis on very strong explosive shocks in air. This expanded second edition features substantial new material on sound wave parameters, Riemann's method for numerical integration of the equations of motion, approximate analytical expressions for weak shock waves, short duration piston motion, numerical results for shock wave interactions, and new appendices on the piston withdrawal problem and numerical results for a closed shock tube. This text will appeal to students, researchers, and professionals in shock wave research and related fields. Students in particular will appreciate the

benefits of numerical methods in fluid mechanics and the level of presentation.

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