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Titolo	Introduction to Simple Shock Waves in Air : With Numerical Solutions Using Artificial Viscosity / / by Seán Prunty
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ISBN	3-030-02565-9
Edizione	[1st ed. 2019.]
Descrizione fisica	1 online resource (257 pages)
Collana	Shock Wave and High Pressure Phenomena, , 2197-9529
Disciplina	533.293
Soggetti	Fluid mechanics Fluids Mathematical physics Physics Engineering Fluid Dynamics Fluid- and Aerodynamics Mathematical Applications in the Physical Sciences Mathematical Methods in Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Brief outline of the equations of fluid flow -- Waves of finite amplitude -- Conditions across the shock: the Rankine-Hugoniot equations -- Numerical treatment of plane shocks -- Spherical shock waves: the self-similar solution -- Numerical treatment of spherical shock waves.
Sommario/riassunto	This book provides an elementary introduction to some 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. Artificial viscosity is introduced into the numerical calculations in order to deal with shocks. The presentation is restricted to the finite-difference approach to solve the coupled differential equations of fluid flow as distinct from finite-volume or finite-element methods. This text 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 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.