1. Record Nr. UNINA9911001784103321

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Titolo	Stabilization of Hypersonic Boundary-Layer: Acoustic Metasurfaces / / by Rui Zhao, Guohua Tu, Jun Liang, Chihyung Wen
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2025
ISBN	981-9786-23-1
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (VI, 241 p. 211 illus., 194 illus. in color.)
Disciplina	620.1064
Soggetti	Fluid mechanics Aerospace engineering Astronautics Engineering Fluid Dynamics Aerospace Technology and Astronautics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction and Objective -- Hypersonic Boundary-Layer Stabilization -- Acoustic Metasurface Modelling -- Acoustic Metasurface Design -- Stabilization Mechanisms -- Other Stabilization Methods -- Conclusions and Prospects.
Sommario/riassunto	This book explores the mechanisms and applications of acoustic metasurfaces in the hypersonic transition control area. It begins with an introduction of the concepts of acoustic metasurface and hypersonic boundary-layer stabilization, which also provides a full scene of the research progress in the past two decades. This book then discusses the modeling methods of various acoustic metasurfaces, including the regular and irregular ones, and describes how the models are to be used in theoretical analysis and numerical calculations. The design strategies and optimization methods are presented to promote the applications in the engineering community. The possible stabilization mechanisms are explored, and the proposed analysis methods are used to clarify other flow instabilities. This book delivers valuable insight for aerospace engineers, postgraduate students, and researchers.