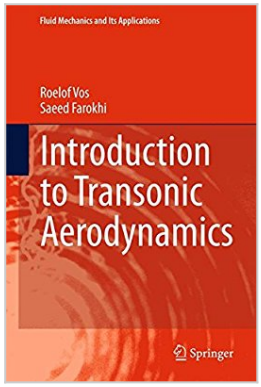

Introduction to Transonic Aerodynamics (Fluid Mechanics and Its Applications)

By Roelof Vos, Saeed Farokhi

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Written to teach students the nature of transonic flow and its mathematical foundation, this book offers a much-needed introduction to transonic aerodynamics. The authors present a quantitative and qualitative assessment of subsonic, supersonic and transonic flow around bodies in two and three dimensions. The book reviews the governing equations and explores their applications and limitations as employed in modeling and computational fluid dynamics.

Some concepts, such as shock and expansion theory, are examined from a numerical perspective. Others, including shock-boundary-layer interaction, are discussed from a qualitative point of view. The book includes 60 examples and more than 200 practice problems. The authors also offer analytical methods such as Method of Characteristics (MOC) that allow readers to practice with the subject matter.

The result is a wealth of insight into transonic flow phenomena and their impact on aircraft design, including compressibility effects, shock and expansion waves, shock-boundary-layer interaction and aeroelasticity.

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- 555 pages

Editorial Review

Review

"This textbook is a comprehensive introduction to transonic external aerodynamics. … It is intended primarily for senior undergraduate students or graduate students with prior knowledge in aerodynamics, but it provides useful informations to all specialists interested in transonic flows." (Adrian Carabineanu, zbMATH, Vol. 1326.76001, 2016)

From the Back Cover

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About the Author

Dr. ir. Roelof Vos

Roelof Vos holds a BSc degree in Aerospace Engineering from Delft University of Technology which he received in 2004. He earned an MSc degree from that same university which he received with honors in 2005. Sponsored by a VSBfonds scholarship, he subsequently worked for 6 months as a post-graduate researcher at The University of Manchester. In 2006 Vos received a Fulbright Scholarship to pursue a PhD degree at The University of Kansas. His research was acknowledged with the AIAA Abe Zarem Award in 2008. Vos obtained his PhD degree in 2009. Since then Vos has been working as assistant professor at the Aerospace Engineering Faculty of Delft University of Technology. He teaches courses on aircraft design, aerodynamic design of transport aircraft and aerodynamic design of combat aircraft. His research focuses on the development of aircraft analysis methodologies for the conceptual design phase, the design of new aircraft configurations and the assessment of emerging aviation technologies. He has published 12 articles in peer-reviewed journals and over 30 conference papers. He has worked on various projects funded by the European Commission. He is a senior member of AIAA and a member of the AIAA Aircraft Design Technical committee.

Dr. Saeed Farokhi

His undergraduate education in Aeronautical and Astronautical Engineering was in the University of Illinois in Urbana-Champaign, where he graduated with the Highest Honors in 1975. His Master s and PhD degrees came from MIT in Cambridge, Massachusetts in 1976 and 1981 respectively, both in Aeronautics and Astronautics. He then joined the Gas Turbine Division of Brown, Boveri and Company in Baden, Switzerland, where he worked as a Design and Development Engineer for four years. Farokhi joined the University of Kansas in 1984, where he is a Professor of Aerospace Engineering. He is the author of a popular textbook: "Aircraft Propulsion," which was first published in 2009 and its "2nd Edition" was published by Wiley in 2014.Farokhi s research has mainly been in flow control, unsteady flows, flows with swirl, aeroacoustics and wind turbine engineering. He is a co-inventor (and a U.S. patent holder) on a smart supersonic vortex generator. Farokhi s research has received funding from numerous government organizations, including NASA, DoD, DoE, DoT, among others as well as aircraft industry.He has over 100 publications in journals and conference proceedings to his credit. Farokhi is a Fellow of the Royal Aeronautical Society, a Fellow of ASME and an Associate Fellow of AIAA."

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