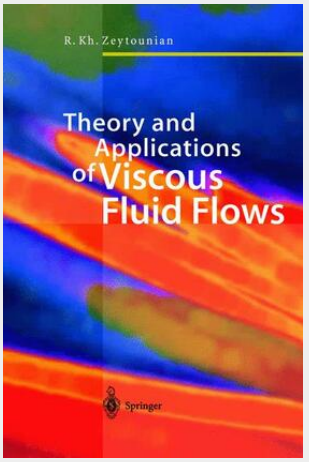
Zeytounian

Theory and Applications of Viscous Fluid Flows



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This book is the natural sequel to the study of nonviscous fluid flows pre sented in our recent book entitled "Theory and Applications of Nonviscous Fluid Flows" and published in 2002 by the Physics Editorial Department of Springer-Verlag (ISBN 3-540-41412-6 Springer-Verlag, Berlin, Heidelberg, New York). The physical concept of viscosity (for so-called "real fluids") is associated both incompressible and compressible fluids. Consequently, we have with a vast field of theoretical study and applications from which any subsection could have itself provided an area for a single book. It was, however, decided to attempt aglobal study so that each chapter serves as an introduction to more specialized study, and the book as a whole presents a necessary broad foundation for furt her study in depth. Consequently, this volume contains many more pages than my preceding book devoted to nonviscous fluid flows and a large number (80) of figures. There are three main models for the study of viscous fluid flows: First, the model linked with viscous incompressible fluid flows, the so-called (dynamic) Navier model, governing linearly viscous divergenceless and homogeneous fluid flows. The second is the sü-called Navier-Stokes model (NS) which is linked to compressible, linearly viscous and isentropic equations für a polytropic viscous gas. The third is the so-called Navier-Stokes-Fourier model (NSF) that gov erns the motion of a compressible, linearly viscous, heat-conducting gas.

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