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Thermofluidynamics of Optimized Rocket Propulsions: Extended Lewis Code Fundamentals

By STRAUB

Birkhäuser. Paperback. Condition: New. 272 pages. Dimensions: 9.0in. x 6.0in. x 0.6in. This study has two declared aims: it presents the theoretical basis for a provably ideal comparative process for relaxing flows (ICP) and justifies its application to jet and, in particular, rocket engines. This will be treated in two parts. Part I offers a status quo report on current calculation methods, and compiles and explains briefly the most important data on selected prominent rocket engines. Starting from the phenomenology of the dynamical and physico-chemical conversion processes in the fuel-oxidizer fluid mixture and in the burned gases, the ideal thermodynamic comparative process is then derived - as a defined sequential change of states in the system. In order to render this comparative process readily understandable, it is first applied to an appropriate model gas using algebraic equations for all relevant parameters. This model gas undergoes energy conversion processes without forfeiting the simplicity of presentation typical of classical gas dynamics. Above all, examination of this model offers proof that it is generally impermissible to use, as is done in practice, the familiar isentropic equation for flow changes of state continuously propagated in flow tube theory. Elementary calculations...



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