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## An Automated Code Generator for Three-Dimensional Acoustic Wave Propagation with Geometrically Complex Solid Wall Boundaries (Paperback)

By Rodger William Dyson

Biblioscholar, United States, 2013. Paperback. Condition: New. Language: English . This book usually ship within 10-15 business days and we will endeavor to dispatch orders quicker than this where possible. Brand New Book. Finding the sources of noise generation in a turbofan propulsion system requires a computational tool that has sufficient fidelity to simulate steep gradients in the flow field and sufficient efficiency to run on today's computer systems. The goal of this dissertation was to develop an automated code generator for the creation of Software that numerically solves the linearized Euler equations on Cartesian grids in three dimensional spatial domains containing bodies with complex shapes. It is based upon the recently developed Modified Expansion Solution Approximation (MESA) series of explicit finite-difference schemes that provide spectral-like resolution with extraordinary efficiency. The accuracy of these methods can, in theory, be arbitrarily high in both space and time, without the significant inefficiencies of Runge-Kutta based schemes. The complexity of coding these schemes was, however, very high, resulting in code that could not compile or took so long to write in FORTRAN that they were rendered impractical. Therefore, a tool in Mathematica was developed that could automatically code the MESA schemes into...



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