

NASA Technical Reports Serve (NTRS), Timothy J. Barth



## Error and Uncertainty Quantification in the Numerical Simulation of Complex Fluid Flows

By Timothy J. Barth

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 40 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. The failure of numerical simulation to predict physical reality is often a direct consequence of the compounding effects of numerical error arising from finitedimensional approximation and physical model uncertainty resulting from inexact knowledge andor statistical representation. In this topical lecture, we briefly review systematic theories for quantifying numerical errors and restricted forms of model uncertainty occurring in simulations of fluid flow. A goal of this lecture is to elucidate both positive and negative aspects of applying these theories to practical fluid flow problems. Finite-element and finite-volume calculations of subsonic and hypersonic fluid flow are presented to contrast the differing roles of numerical error and model uncertainty. for these problems. This item ships from La Vergne,TN. Paperback.



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