BOOK REVIEWS

Proceedings of Seventh International Conference on Numerical Methods in Fluid Dynamics

Edited by W. C. Reynolds and R. W. MacCormack

These proceedings are arranged with the four invited lectures at the beginning and 68 contributed papers, each occupying 6 or 7 pages, following in alphabetical order. Production from individually prepared camera-ready copy makes for quick and cheap publication but inevitably leads to considerable variability in the quality of the text, though nearly all the many figures are very clear in spite of their small size.

Despite the breadth of the title, there is a strong emphasis on aerodynamic flows and it is to those concerned with such fields of application that this volume will be of most use. The opening article by Chapman, 'Trends and pacing items in computational aerodynamics', immediately sets this tone: it is a succinct review of the increasing importance of computation in aerodynamic design and the growing confidence with which more and more complicated problems are undertaken. Viviand's is a more specialised review of pseudo–unsteady methods for transonic flow computations, which concedes that they are less efficient than the more recent multigrid and approximate factorisation methods. Rusanov addresses basic questions on the structure of approximations to discontinuous flows and Longuet-Higgins gives three examples of the use of polygonal conformal transformations to study flows where the boundary has many sharp-pointed crests.

The contributed papers are, of course, too short to be of much use to anyone unfamiliar with computational fluid dynamics. Their real value is to those active in the field who can obtain up to date snapshots of its many aspects as pursued by the large number of participants from several different countries. With no attempt by the editors to arrange the material into sub-sections, it is quite difficult to obtain an overall picture of the activity and it is useful to know the names to look for when consulting the volume, even though this is sometimes difficult with multi-author papers.

Though gas flows, and in particular aerodynamics, dominate the applications that are specifically considered, many of the papers concentrate on numerical methods and their analysis so that the results are often of more general interest. It does mean, however, that there is a greater emphasis on well-established finite difference methods and fewer articles on finite elements than would appear, for instance, at a conference dealing with hydraulic flows.

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Turbulent Buoyant Jets and Plumes

W. Rodi (Ed)

This is the sixth volume in the Science and Applications of Heat Transfer series, and contains three independent papers on related subjects: an excellent and authoritative review of the title problem by E. J. List of Caltech is followed by an article by G. H. Jirka of Cornell on buoyant jets in shallow fluid layers (eg rivers) and a presentation by Hossain and Rodi of Karlsruhe of an extension to buoyant flows of what they rightly describe as "the widely tested and used k-ε model".

Taken together, the three papers provide a good, well-written coverage of the state of the art, but the authors and editor seem not to have attempted a uniform treatment or even a uniform notation; for example the respective authors use the symbols $\bar{u}$, u and U for the x-component mean velocity, and Hossain and Rodi's paper, in particular, could equally well have appeared in an original research journal. These criticisms, however, are more aesthetic than scientific, the environmental scientist with some background in turbulence studies will find that the three papers provide him with a review of the mechanics and an introduction to calculation methods of varying degrees of complexity. These papers also provide a useful briefing for research workers seeking a project or engineers seeking a solution.

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