

Implementation of Finite Element Methods for Navier–Stokes Equations

F. Thomasset

This little book contains many results and ideas from the finite element method and will be of interest to applied mathematicians, physicists and engineers involved in computational fluid mechanics. It is based on Thomasset's lectures at the Von Karman Institute in 1980 and so is not completely up to date. For example, his plea in Chapter 4 for the driven cavity flow to be taken up as a standard problem has rather been overtaken by events. Unsatisfactory aspects of this problem as a test led G. De Vahl Davis and I. P. Jones to propose another benchmark, convective cavity flow, which attracted 36 contributions from nine countries for the Venice Conference on Numerical Methods in Thermal Problems in July 1981. Likewise the book's references cover really only the literature to 1979. However, they still form a very useful compilation, especially of European work in the field, a feature which will interest Anglo-Saxon readers. The author has maintained readability with brevity and judicious use of footnotes and references for many of the details. The style of writing and presentation is good considering the amount of technical material and there are no more misprints or Gallicisms than one would normally expect. The latter, for example the usual sprinkling of equations being 'verified' by solutions and an appealing use of 'confort' on page 19, are not at all troubling and indeed add some charm and character to the work. Having read right through the 150 pages of text, I now find myself dipping into the work quite frequently for points and, especially, references which I know to be there. For this role, the book can be recommended.

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IMEKO 9th World Congress

The 9th World IMEKO Congress opened in Berlin appropriately with a fanfare from members of the Philharmonic Orchestra and a welcome from the Regierende Burgermeister Dr Von Weizsäcker. The location chosen, the Internationales Congress Centrum, is ideally suited to such a meeting and approximately 700 attendees could have few complaints about the organization. Interpretation between German and English was excellent; indeed the interpreters often managed to impart a spontaneity to the presentations which the speakers themselves perhaps lacked, understandably as the great majority of the speakers were having to make their remarks not in their mother tongue.

My interest lay in the flow measurement aspects of the Congress; three of the main Sessions were devoted to this subject as well as papers given in the Poster Sessions. In addition there was a session on the subject of heat metering involving as it does the flow measurement of hot water. This meant that over 30 of the 200 or so papers were split into a general session on flow measurement together with one specifically on correlation methods, one on heat

meters and one on laser velocimeter measurements. Attendance was excellent being more than 150 for the first two and around 100 for the third and fourth. It was clear that the interest was demonstrably maintained in that more than 100 stayed on until the afternoon correlation techniques session finished at 1830.

A lively open discussion on the industrial potential for these techniques was held the following late afternoon in a Round Table meeting for which I was responsible as the Chairman of IMEKO Technical Committee No 9: Flow Measurement*. Speakers took sides in their assessments of the future of correlation methods ranging from the belief that it would never be possible to obtain high accuracy to the viewpoint that while there would be a small place for devices based on this principle they would never take over from the highly repeatable turbine meter or the ubiquitous orifice plate. I suggested that there was a future for a meter using correlation techniques in addition to another principle to meet the need in the next ten years for instruments which are self-analysing and thus capable of monitoring whether the environment and the fluid flowing or the instrument itself has changed. A single meter

^{*} At this meeting it was announced that a flow measurement conference, FLOWMEKO '83, will be held in Budapest on 20–22 September 1983. Abstracts for papers will be invited soon