FURTHER DEVELOPMENTS IN TURBULENCE MANAGEMENT

FLUID MECHANICS AND ITS APPLICATIONS
Volume 19

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Aims and Scope of the Series

The purpose of this series is to focus on subjects in which fluid mechanics plays a fundamental role.

As well as the more traditional applications of aeronautics, hydraulics, heat and mass transfer etc., books will be published dealing with topics which are currently in a state of rapid development, such as turbulence, suspensions and multiphase fluids, super and hypersonic flows and numerical modelling techniques.

It is a widely held view that it is the interdisciplinary subjects that will receive intense scientific attention, bringing them to the forefront of technological advancement. Fluids have the ability to transport matter and its properties as well as transmit force, therefore fluid mechanics is a subject that is particulary open to cross fertilisation with other sciences and disciplines of engineering. The subject of fluid mechanics will be highly relevant in domains such as chemical, metallurgical, biological and ecological engineering. This series is particularly open to such new multidisciplinary domains.

The median level of presentation is the first year graduate student. Some texts are monographs defining the current state of a field; others are accessible to final year undergraduates; but essentially the emphasis is on readability and clarity.

For a list of related mechanics titles, see final pages.

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Preface

This special issue of *Applied Scientific Research* returns to the theme of turbulence manipulation with a view to reduce drag. It provides a selection of papers presented at the Sixth European Drag Reduction Meeting held at the Eindhoven University of Technology at Eindhoven in November 1991. The procedures adopted in the preparation of this issue was similar to the ones used in the two earlier proceedings volumes brought out by Kluwer Academic Publishers in 1990 and 1991.

A significant departure of the present issue from the earlier proceedings volumes is the virtual absence of papers on LEBU's indicating their unfulfilled promise of drag reduction. However, there is one paper that considers their potential for manipulating heat transfer from surfaces. All the rest of the papers are devoted to surface-initiated manipulators. The bulk of the present issue is concerned with riblets. An attitude shared among the authors is that riblets reduce drag. The main question addressed thus is the mechanism responsible for this behaviour of turbulent flows. The papers reflect the general thrust of modern day turbulence research in their concern on coherent structures on the one hand and modelling on the other hand. The latter approach combined with the detailed analysis of the viscous sublayer provided in one of the papers can be the way forward for the design of optimized riblet shapes to yield increased drag reduction. The d-type roughness/cavity has continued to attract the attention of the research community as evidenced by the presence of two papers on the subject and a third one looking af the effectiveness of dilute polymer and surfactant solutions flowing over such surfaces.

The Sixth European Drag Reduction meeting was hosted by the Eindhoven University of Technology by providing all the infrastructure necessary for any such meeting. The European Research Community on Flow Turbulence and Combustion (ERCOFTAC) provided a few scholarships to enable young researchers to participate in the meeting; Kluwer Academic Publishers provided a grant that came in handy to meet some of the external costs of the meeting. Lastly, Addy Schwarz van Manen looked after scores of details in connection with the meeting's organization. To all these I owe a special thanks.

Eindhoven, February 1993

K. KRISHNA PRASAD
Guest Editor