

Structure of Complex Turbulent Shear Flow

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Editors
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Preface

The Symposium on Structure of Complex turbulent shear flows was proposed by the "Comité National Français de Mécanique" to the General Assembly of the International Union of Theoretical and Applied Mechanics. The Symposium was to be organized in Marseille by the "Institut de Mécanique Statistique de la Turbulence" (I.M.S.T.). This Institute has long standing experience in the area of turbulence. The subject of the Symposium had been submitted previously to the Comité National Français de Mécanique by R. Dumas and L. Fulachier, at the I.M.S.T., who were later invited to chair the Symposium. At the same time, Professors J.K. Keffer, B.E. Launder and J.L. Lumley assured them of their interest in and scientific support of the proposal, in view of the need to advance theoretical or modelling knowledge on the strength of experimental evidence. This is especially true in the case of complex turbulent shear flows where, in contrast to classical flows, distortions, asymmetries or interactions significantly affect the turbulence structure. The Scientific Committee of the Symposium approved this purpose and invited scientists to present their experimental findings for complex situations including both wall flows and free shear flows. The measurement technique was to be explicitly described to insure the reliability of the results. Moreover, the effect of strong compressibility, as in supersonic flows, was included in the scope of the conference, provided attention was focused on the structure of the turbulence. Buoyancy effects were not considered; however, those situations where heat was acting as a passive contaminant fell within the theme of the Symposium.

From 72 papers submitted for presentation, 37 contributions were selected by the Scientific Committee. Each paper was reviewed by at least two members of the Scientific Committee. Other referees were also used, especially in the case of supersonic flows. Some papers which related only to classical shear flows without special complexity, were selected because of their strong relevance to the understanding of the structure of turbulence.

The time for presentation was thirty minutes allowing ample time for discussions. It was expected that the latter would be fruitful, in view of the participation of some of the best specialists in the field. Following the rule of I.U.T.A.M., the Symposium was reserved to invited participants, which insured that the attendants were fully cognizant of the subject. Further, three general discussions pertaining to wall, free and supersonic flows and a final discussion were included to help improve our understanding of these shear flows which should in turn improve closure assumptions for the modelling of these flows. These discussion sessions are presented at the end of each main topic in this volume.

We also hope that the meeting gave the participants a chance to talk to each other, exchange ideas and possibly initiate cooperative projects.

The main conclusion was that we need high accuracy experiments in not too complicated situations together with exploratory experiments. In this connection, we have added to this volume a presentation written by Professor Kline.

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We are very grateful to the Members of the Scientific Committee who, without exception, attended the Meeting and contributed effectively to the discussions. We also would like to thank the Session Chairmen, the Authors and all Participants for their active cooperation.

Our thanks also go to the staff of I.M.S.T. and especially to the Local Organizing Committee, Doctors M.P. Chauve, J.P. Dussauge and R. Schiestel.

We also acknowledge the administrative delegate of the C.N.R.S., at Marseille who allowed us to use the lecture room and other facilities of the C.N.R.S. laboratories' Campus.

We thank the Institutions which provided financial support, the I.U.T.A.M., l'Association Universitaire de Mécanique, the C.N.R.S., the I.M.S.T. and the mayor of the town of Marseille for the cocktail invitation he graciously extended to the members of the Symposium and accompanying persons.

We are indebted to the Editorial staff of Springer - Verlag for their valuable help with the publication of the Symposium's Proceedings.

Marseille, October 1982

R. Dumas , L. Fulachier

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