

CONTENTS

Preface	1
I. Modeling	
Overview	3
Non-linear $k - \varepsilon - v^2$ modeling with application to high-lift. F. S. LIEN and P. A. DURBIN	5
Application of the $k - \varepsilon - v^2$ model to multi-component airfoils. G. IACCARINO and P. A. DURBIN	23
A new approach to turbulence modeling. B. PEROT and P. MOIN	35
Second moment closure analysis of the backstep flow database. S. PARNEIX, D. LAURENCE and P. DURBIN	47
On modeling pressure diffusion in non-homogeneous shear flows. A. O. DEMUREN, M. M. ROGERS, P. DURBIN and S. K. LELE	63
Prediction of the backflow and recovery regions in the backward facing step at various Reynolds numbers. V. MICHELASSI, P. A. DURBIN and N. N. MANSOUR	73
II. Combustion	
Overview	87
A-priori testing of sub-grid models for chemically reacting nonpremixed turbulent shear flows. J. JIMÉNEZ, A. LIÑÁN, M. M. ROGERS and F. J. HIGUERA	89
Turbulent flame propagation in partially premixed flames T. POINSOT, D. VEYNANTE, A. TROUVÉ and G. RUETSCH	111
A dynamic subgrid-scale model for LES of the G-equation. A. BOURLIOUX, H. G. IM and J. H. FERZIGER	137
A new methodology to determine kinetic parameters for one- and two- step chemical models. T. MANTEL, F. N. EGOLFOPOULOS and C. T. BOWMAN	149
Evaluation of joint probability density function models for turbulent nonpremixed combustion with complex chemistry. N. S. A. SMITH, S. M. FROLOV and C. T. BOWMAN	167
Effect of chemistry and turbulence on NO formation in oxygen-natural gas flames. J.-M. SAMANIEGO, F. N. EGOLFOPOULOS and C. T. BOWMAN	187
Asymptotic solution of the turbulent mixing layer for velocity ratio close to unity. F. J. HIGUERA, J. JIMÉNEZ and A. LIÑÁN	207

The effects of complex chemistry on triple flames. T. ECHEKKI and J. H. CHEN	217
III. Large Eddy Simulation	
Overview	235
Ensemble averaged dynamic modeling. D. CARATI, A. WRAY and W. CABOT	237
Anisotropic eddy viscosity models. D. CARATI and W. CABOT	249
Dynamic Smagorinsky model on anisotropic grids. A. SCOTTI, C. MENEVEAU, and M. FATICA	259
Dynamic model with scale-dependent coefficients in the viscous range. C. MENEVEAU and T. S. LUND	275
The incremental unknowns - multilevel scheme for the simulation of turbulent channel flows. M. CHEN, H. CHOI, T. DUBOIS, J. SHEN and R. TEMAM	291
A priori testing of subgrid-scale models for the velocity-pressure and vorticity-velocity formulations. G. S. WINCKELMANS, T. S. LUND, D. CARATI and A. A. WRAY	309
LES on unstructured deforming meshes: towards reciprocating IC engines. D. C. HAWORTH and K. JANSEN	329
Large eddy simulation of a backward facing step flow using a least squares spectral element method. D. C. CHAN and R. MITTAL	347
Evaluation of a vortex-based subgrid stress model using DNS databases. A. MISRA and T. S. LUND	359
IV. Control, Structures, and Hydroacoustics	
Overview	367
Hydroacoustic forcing function modeling using DNS database. I. ZAWADZKI, J. L. GERSHFELD, Y. NA and M. WANG	369
A study of the turbulence structures of wall-bounded shear flows. M. S. CHONG, J. SORIA, A. E. PERRY, J. CHACIN, Y. NA and B. J. CANTWELL	383
Optimal and robust control of transition. T. R. BEWLEY and R. AGARWAL	405
Simulation and modeling of the elliptic streamline flow. G. A. BLAISDELL and K. SHARIFF	433
Drag reduction in turbulent MHD pipe flows. P. ORLANDI	447