CONTENTS

Preface 1

A local dynamic model for large eddy simulation. S. GHOSAL, T. S. LUND and P. MOIN 3

Parameterization of subgrid-scale stress by the velocity gradient tensor. T. S. LUND and E. A. NOVIKOV 27

Large eddy simulations of time-dependent and buoyancy-driven channel flows. W. CABOT 45

A normal stress subgrid-scale eddy viscosity model in large eddy simulation. K. HORIUTI, N. N. MANSOUR and J. KIM 61

Large eddy simulation of shock turbulence interaction. S. LEE 73

Application of a dynamic subgrid-scale model to turbulent recirculating flows. Y. ZANG, R. L. STREET, and J. R. KOSEFF 85

Large-eddy simulation of turbulent flow with a surface-mounted two-dimensional obstacle. K.-S. YANG and J. H. FERZIGER 97

Similarity states of homogeneous stably-stratified turbulence at infinite Froude number. J. R. CHASNOV 113

Application of incremental unknowns to the Burgers equation. H. CHOI and R. TEMAM 129

Direct simulation of compressible wall-bounded turbulence. G. N. COLEMAN 139

Direct numerical simulation of hot jets. M. C. JACOB 145

Direct numerical simulation of turbulent flow over a backward-facing step. H. LE AND P. MOIN 161

Numerical simulation using vorticity-vector potential formulation. H. TOKUNAGA 175

Reynolds stress closure modeling in wall-bounded flows. P. A. DURBIN 185

Application of a Reynolds stress model to separating boundary layers. S. H. KO 199

Progress in modeling hypersonic turbulent boundary layers. O. ZEMAN 213

Receptivity in parallel flows: an adjoint approach. D. C. HILL 227

Local isotropy in high Reynolds number turbulent shear flows. S. G. SADDOUGHI 237

An investigation of small scales of turbulence in a boundary layer at high Reynolds numbers. J. M. WALLACE, L. ONG and J.-L. BALINT 263

Probability density distribution of velocity differences at high Reynolds numbers. A. A. PRASKOVSKY 269

The 'ideal' Kolmogorov inertial range and constant. Y. ZHOU 277

The helical decomposition and the instability assumption. F. WALEFFE 285

Superfluid turbulence. D. C. SAMUELS 291

Regeneration of near-wall turbulence structures. J. M. HAMILTON, J. KIM and F. WALEFFE 303

Experiments on near-wall structure of three-dimensional boundary layers. K. A. FLACK and J. P. JOHNSTON 317

The three-dimensional evolution of a plane wake. H. MAEKAWA, R. D. MOSER and N. N. MANSOUR 325

Mixing in a stratified shear flow: energetics and sampling. G. N. IVEY, J. R. KOSEFF, D. A. BRIGGS and J. H. FERZIGER 335

LIF measurements of scalar mixing in turbulent shear layers. P. S. KARASSO and M. G. MUNGAL 345

Plane mixing layer vortical structure kinematics. R. L. LEBOEUF 357

Numerical simulation of the non-Newtonian mixing layer. J. AZAIEZ and G. M. HOMSY 373

PDF approach for turbulent scalar field: some recent developments. F. GAO 381

The evolution equation for the flame surface density in turbulent premixed combustion. A. TROUVÉ 393

Study and modeling of finite rate chemistry effects in turbulent non-premixed flames. L. VERVISCH 411

Generation of two-dimensional vortices in a cross-flow. J.-M. SAMANIEGO 431

Why does preferential diffusion heavily affect premixed turbulent combustion? V. R. KUZNETSOV 443

Tensoral: a system for post-processing turbulence simulation data. E. DRESSELHAUS 455

Appendix: Center for Turbulence Research 1992 Roster 461