Contents

Part I	Stability and Transition	
Flow	reading Mechanism of a Turbulent Spot in Plane Poiseuille enningson (With 4 Figures)	2
Poiseuille By B.G.B.	An Experimental Study of the Velocity Field of Turbulent Spots in Plane Poiseuille Flow By B.G.B. Klingmann, P.H. Alfredsson, and D.S. Henningson (With 9 Figures)	
– An Aspe	tages of Laminar–Turbulent Transitions in a Wall-Bounded Flow act of the Symmetry of Certain Patterns of Turbulence złowski (With 1 Figure)	15
	ernal Order and Structures in a Transitional Spot colov, R.A. Antonia, and R. Sankaran (With 6 Figures)	23
Part II	General Structure, Coherent Structures and Vortex Dynamics	
Some Ren By A. Din	narks on the Probability Distribution of $\partial u/\partial t$ in Turbulent Flow skelacker, C. Baumann, and W. Otto (With 5 Figures)	32
	Structures and the Turbulent Prandtl Number vre-Marinet and G. Binder (With 9 Figures)	37
	Transition Processes of Mixing Layers By C.M. Ho, Y. Zohar, J.K. Foss, and L.S. Huang (With 5 Figures)	
	The Dynamics of Vortex Rings in an Unbounded Domain By K. Ishii, F. Hussain, K. Kuwahara, and C.H. Liu (With 4 Figures)	
Multiple I By H.T. k	Large-Scale Coherent Structures in Free Turbulent Shear Flows Kaptanoglu and J.T.C. Liu (With 2 Figures)	57
Dimension	nensional Vorticity Dynamics in the Near Wake Behind Two- nal Bodies asheras and E. Meiburg (With 5 Figures)	62
Flows Lac	essibility of an Inverse Cascade in Three-Dimensional Anisotropic cking Parity Invariance noll, PL. Sulem, Z.S. She, and U. Frisch (With 2 Figures)	69

Part III Free Shear Flows	
The Statistical Properties of the Vorticity Field of a Two-Stream Turbulent Mixing Layer By JL. Balint and J.M. Wallace (With 8 Figures)	74
Formation of Helical Structures in a Round Free Jet By J.W. Elsner, S. Drobniak, and R. Klajny (With 4 Figures)	
Measurement and Modeling of Anisotropic Turbulent Flows By J. Groth, M. Hallbäck, and A.V. Johansson (With 5 Figures)	
Vorticity Based Intermittency Measurements in a Single Stream Shear	
Layer By R.C. Haw, J.K. Foss, and J.F. Foss (With 5 Figures)	90
Subharmonic Resonance in a Shear Layer By H.S. Husain and F. Hussain (With 5 Figures)	96
Large-Eddy Interpretation of LDA Results Obtained by Conditional	
Seeding in a Circular Jet By B. Lehmann (With 5 Figures)	102
Entrainment in Free Turbulent Flows By A.A. Townsend	109
Part IV Wall-Bounded Flows	
Turbulent Flow over Two-Dimensional, Surface-Mounted Obstacles: Plane and Axisymmetric Geometries By G. Dimaczek, C. Tropea, and A.B. Wang (With 11 Figures)	114
Propagation of Small Perturbations Through the Structure of Turbulence in a Wall Boundary Layer By H. Flötke, J. Schewe, V. Wendt, and D. Ronneberger (With 4 Figures)	122
Cross Correlation and Length Scales in Turbulent Flows near Surfaces	122
By J.C.R. Hunt, P. Moin, M. Lee, R.D. Moser, P. Spalart, N.N. Mansour, J.C. Kaimal, and E. Gaynor (With 7 Figures)	128
On the Relation Between Sweeps and Streamwise Vortices By M. Randolph, H. Eckelmann, and S.G. Nychas (With 6 Figures)	135
Experimental Data on Wall Turbulence in Bubble Flows By M. Souhar (With 3 Figures)	
A New Modelling Approach to Complex Turbulent Shear Flows By M.D. Zhou (With 8 Figures)	146
Part V Turbulent Diffusion, Effects of Rotation, Stratification, Buoyancy	and
Phase Turbulence in Fluid Systems By F.H. Busse (With 1 Figure)	152

Spectral Approach to Axisymmetric Turbulence in a Stratified Fluid By C. Cambon (With 4 Figures)			
Experimental Study of Rotation Effects on Grid Generated Turbulence with Different Mesh Sizes	1.60		
By L. Jacquin, P. Geffroy, and O. Leuchter (With 6 Figures)	168		
Turbulent Diffusion in a Stratified Fluid By M. Larcheveque (With 1 Figure)			
Cross-Spectral Properties of Large Eddies in the Stably Stratified Atmospheric Boundary Layer By S.D. Mobbs and J.M. Rees (With 4 Figures)	180		
Molecular and Stratification Effects on the Evolution of Concentration Fluctuations in Decaying Homogeneous Turbulence with Transverse Mean- Concentration Gradient			
By K. Oduyemi and R.E. Britter (With 3 Figures)	186		
Turbulent Diffusion from Thermal or Reactive Sources: Numerical			
Experiment By A. Picart, J.P. Chollet, and R. Borghi (With 11 Figures)	192		
Internal and External Mixing in Stratified-Shear Flow By J.M. Redondo (With 5 Figures)	198		
Free Convection Grid Turbulence By C. Rey and A. Boudjemaa (With 5 Figures)	204		
Heat Transfer by Thermals in the Convective Boundary Layer By U. Schumann and H. Schmidt (With 4 Figures)	210		
Turbulent Diffusion By D.J. Thomson	216		
Part VI Experimental Methods and Instrumentation			
Turbulence Experiments – Instrumentation and Processing of Data By P.H. Alfredsson and A.V. Johansson (With 8 Figures)	230		
A Turbulent Wall Layer Visualization System Using a Dense Fog and a Scanning Laser Beam			
By J.M. Bessem, C. Nieuwvelt, J.C. Stouthart, and J.C.H. Zeegers (With 4 Figures)	244		
Analysis of Structures in a Turbulent, Plane Mixing Layer by Use of a Pseudo Flow Visualization Method Based on Hot-Wire Anemometry By J. Delville, S. Bellin, J.H. Garem, and J.P. Bonnet (With 6 Figures) .	251		
Skin Friction Measurements by Dual Laser-Beam Interferometry By F. Feyzi and U.R. Müller (With 8 Figures)	257		
On Turbulence Measurements with a Split-Film Probe By U. Hartmann and P. Dengel (With 5 Figures)	262		

Vorticity Measurements in a Turbulent Mixing Layer By J.H. Kim and H.E. Fiedler (With 5 Figures)		
Flow Structure Analysis by Laser Rayleigh Techniques By A. Leipertz, K. Kowalewski, J. Haumann, and G. Wu (With 6 Figures)		
Analyzing 3-D Turbulent Motions in Open Channel Flow by Use of Stereoscopy and Particle Tracking By D. Papantoniou and T. Dracos (With 1 Figure)	278	
Particle Tracking in Turbulent Flows By R.J. Perkins and J.C.R. Hunt (With 13 Figures)		
A New Hot-Wire Technique for Measuring the Instantaneous Velocity Vector in Highly Turbulent Flow By T. Schön and U.R. Müller (With 11 Figures)	292	
Measurements of Instantaneous Flow Angles by Optical Detection of the Thermal Wake of a Hot Wire By G. Janke, C. Larivé, and A. Tailland (With 6 Figures)	298	
Part VII Numerical Methods: Direct Computer Simulations, Lan Eddy Simulations and Closure Predictions	rge-	
Pressure-Strain Rate Events in Homogeneous Turbulent Shear Flow By J.G. Brasseur and M.J. Lee (With 5 Figures)	306	
A New Strategy for Hydrodynamics – Lattice Gases By U. Frisch (With 4 Figures)	313	
Particle Trajectories in Turbulent Flow Generated by True-Varying Random Fourier Modes By J.C.H. Fung and R.J. Perkins (With 8 Figures)	322	
Turbulence Model Data Derived from Direct Numerical Simulations By N. Gilbert and L. Kleiser (With 5 Figures)		
Simulating Vortex Interaction by Three-Dimensional Vortex Method By M. Kiya and H. Ishii (With 3 Figures)		
The Prediction of Force Field Effects on Turbulent Shear Flows via Second-Moment Closure By B.E. Launder (With 13 Figures)	338	
An Eddy Damped Quasi Normal Markovian Approach to Compressible Isotropic and Homogeneous Turbulence By JD. Marion, JP. Bertoglio, and J. Mathieu (With 4 Figures)	359	
Three-Dimensional Simulation of Taylor-Couette Flow By N. Matsumoto, S. Shirayama, K. Kuwahara, and F. Hussain (With 4 Figures)	366	
Large Eddy Simulations of Isotropic and Stably-Stratified Turbulence By O. Métais and M. Lesieur (With 5 Figures)	371	

Computation of Turbulent Boundary Layer Flow with Separation – A Critical Evaluation of Parameters Influencing the Numerical Results By B. Schalau, P. Dengel, and F. Thiele (With 6 Figures)		
Direct Simulation of Flow Structures Initiated by a Rotating Cover in a Cylindrical Vessel By J.N. Sørensen and O. Daube (With 7 Figures)		
Statistical Treatment of Many Vortex Systems By R. Takaki (With 6 Figures)		
128 ³ Harmonics Direct Simulation of Homogeneous Rotated Turbulence By C. Teissèdre and K. Dang (With 5 Figures)	397	
On the Geometry of Lines in Two-Dimensional Turbulence By J.C. Vassilicos (With 7 Figures)	404	
Some Numerical Studies of Turbulent Wake over Hills By W.S. Weng, K.J. Richards, and D.J. Carruthers (With 4 Figures)	412	
Large-Eddy Simulation of Turbulent Flow over a Square Rib in a Channel By H. Werner and H. Wengle (With 5 Figures)	418	
Part VIII Manipulation and Control of Turbulence		
Pressure Gradient Effect on the Turbulence Structure over Riblet Surface By Kwing-So Choi and R. Johnson (With 5 Figures)	426	
Generation of and Measurements in a Turbulent Boundary Layer with Zero Skin Friction By P. Dengel and HH. Fernholz (With 6 Figures)	432	
On the Mechanism Involved in a Turbulent Boundary Layer over Riblets By L. Djenidi, J. Liandrat, F. Anselmet, and L. Fulachier (With 5 Figures)	438	
The Spanwise Confined One-Stream Mixing Layer By D. Hilberg and H.E. Fiedler (With 6 Figures)		
Structures in a Turbulent Boundary Layer By T.B. Lynn (With 6 Figures)		
Experiments on the Absolute Instability of Heated Jets By P.A. Monkewitz, D.W. Bechert, B. Barsikow, and B. Lehmann (With 4 Figures)	455	
On the Spanwise Structure of a Plane Mixing Layer By K.J. Nygaard and A. Glezer (With 4 Figures)	461	
The Mixing Layer Between Non-parallel Walls By C.O. Paschereit, M. Schüttpelz, and H.E. Fiedler (With 5 Figures)	467	
The Influence of Drag Reduction Additives on the Coherent Structures in a Free Shear Layer By S. Riediger (With 12 Figures)	472	

Part IX	Applications	
Unsteadine	f Shear Layer Induced Fluctuations on the Velocity ss in Free-Jet Wind Tunnels hel (With 1 Figure)	480
By G. Oon	and the Process Industry ns, P.H.W.M. Daverveldt, D. Roekaerts, P.J.M.M. de Smedt, nborn, and B.U. Felderhof (With 5 Figures)	484
	dization of the Disk-Cylinder Configuration onglei, Wu Hanqing, and Zhang Shangqian (With 2 Figures) .	505
List of Par	ticipants	511
Index of C	Contributors	521