Contents

Part I Invited Lectures

On the Size of the Eddies in the Outer Turbulent Wall Layer: Evidence from Velocity Spectra ............................. 3 Sergio Pirozzoli

Sensitized-RANS Modelling of Turbulence: Resolving Turbulence Unsteadiness by a (Near-Wall) Reynolds Stress Model. 17 Suad Jakirlić and Robert Maduta

Coherent Structures in Wall-Bounded Turbulence ............... 37 Javier Jiménez and Adrián Lozano-Durán

Attached Eddies and High-Order Statistics ......................... 47 Ivan Marusic and James D. Woodcock

Part II Papers

DNS of Turbulent Boundary Layers in the Quasi-Laminarization Process ................................................................. 63 Guillermo Araya, Luciano Castillo and Fazle Hussain

Numerical ABL Wind Tunnel Simulations with Direct Modeling of Roughness Elements Through Immersed Boundary Condition Method ........................................................... 73 Bruno Lopez, Gabriel Usera, Gabriel Narancio, Mariana Mendina, Martin Draper and Jose Cataldo
Three-Dimensional Nature of 2D Hairpin Packet Signatures in a DNS of a Turbulent Boundary Layer ........................................... 83
S. Rahgozar and Y. Maciel

Wall Pressure Signature in Compressible Turbulent Boundary Layers ................................................................. 93
N.A. Buchmann, Y.C. Küçükosman, K. Ehrenfried and C.J. Kähler

Three-Dimensional Structure of Pressure–Velocity Correlations in a Turbulent Boundary Layer .................................................. 103
Yoshitsugu Naka, Michel Stanislas, Jean-Marc Foucaut, Sebastien Coudert and Jean-Philippe Laval

Computation of Complex Terrain Turbulent Flows Using Hybrid Algebraic Structure-Based Models (ASBM) and LES ................. 115
C. Panagiotou, S.C. Kassinos and D. Grigoriadis

Computation of High Reynolds Number Equilibrium and Nonequilibrium Turbulent Wall-Bounded Flows Using a Nested LES Approach .................................................. 125
Yifeng Tang and Rayhaneh Akhavan

An Attempt to Describe Reynolds Stresses of Turbulent Boundary Layer Subjected to Pressure Gradient ........................................ 137
Artur Dróżdż and Witold Elsner

The Temporal Coherence of Prograde and Retrograde Spanwise Vortices in Zero-Pressure Gradient Turbulent Boundary Layers ...... 147
Callum Atkinson, Vassili Kitsios and Soria

Boundary Layer Vorticity and the Rise of “Hairpins” .................. 159
Peter S. Bernard

On the Extension of Polymer Molecules in Turbulent Viscoelastic Flows: Statistical and Tensor Investigation .................. 171
Anselmo Soeiro Pereira, Ramon Silva Martins, Gilmar Mompean, Laurent Thais and Roney Leon Thompson

Velocity of Line Plumes on the Hot Plate in Turbulent Natural Convection ................................................................. 181
Vipin Koothur and Baburaj A. Puthenveettil
LES of a Converging–Diverging Channel Performed with the Immersed Boundary Method and a High-Order Compact Discretization ................................................... 191
Mariusz Ksiezyk and Artur Tyliszczak

On Minimum Aspect Ratio for Experimental Duct Flow Facilities .... 201
Ricardo Vinuesa, Eduard Bartrons, Daniel Chiu, Jean-Daniel Rüedi, Philipp Schlatter, Aleksandr Obabko and Hassan M. Nagib

Riblets Induced Drag Reduction on a Spatially Developing Turbulent Boundary Layer .................................................. 213
Amaury Bannier, Eric Garnier and Pierre Sagaut

Characterization of Pipe-Flow Turbulence and Mass Transfer in a Curved Swirling Flow Behind an Orifice ......................... 225
N. Fujisawa, R. Watanabe, T. Yamagata and N. Kanatani

Turbulent Structure of a Concentric Annular Flow ..................... 237
Sina Ghaemi, Majid Bizhani and Ergun Kuru

Reconstruction of Wall Shear-Stress Fluctuations in a Shallow Tidal River ................................................................. 247
Romain Mathis, Ivan Marusic, Olivier Cabrit, Nicole L. Jones and Gregory N. Ivey

Analysis of Vortices Generation Process in Turbulent Boundary Subjected to Pressure Gradient ............................... 259
Artur Dróżdż and Witold Elsner

Experimental Investigation of a Turbulent Boundary Layer Subject to an Adverse Pressure Gradient at $Re_\theta$ up to 10000 Using Large-Scale and Long-Range Microscopic Particle Imaging .................................................. 271
Tobias Knopp, Nicolas A. Buchmann, Daniel Schanz, Christian Cierpka, Rainer Hain, Andreas Schröder and Christian J. Kähler

The Structure of APG Turbulent Boundary Layers ...................... 283
Ayse G. Gungor, Yvan Maciel and Mark P. Simens

Adverse Pressure Gradients and Curvature Effects in Turbulent Channel Flows .......................................................... 295
A.B. de Jesus, L.A.C.A. Schiavo, J.L. Azevedo and J.-P. Laval
On the Response of a Separating Turbulent Boundary Layer to High Amplitude Excitation

Vitali Palei and Avi Seifert

.......................... 307

Statistical and Temporal Characterization of Turbulent Rayleigh-Bénard Convection Boundary Layers Using Time-Resolved PIV Measurements

Christian E. Willert, Ronald du Puits and Christian Resagk

........................... 317

Large-Scale Organization of a Near-Wall Turbulent Boundary Layer


............................... 335

Near-Wall Study of a Turbulent Boundary Layer Using High-Speed Tomo-PIV

Fabio J.W.A. Martins, Jean-Marc Foucaut, Luis F.A. Azevedo and Michel Stanislas

............................... 347

The Effects of Superhydrophobic Surfaces on Skin Friction Drag

Hyunwook Park and John Kim

.......................................... 357

Structure and Dynamics of Turbulence in Super-Hydrophobic Channel Flow

Amirreza Rastegari and Rayhaneh Akhavan

.......................................... 367

Spectral Assessment of the Turbulent Convection Velocity in a Spatially Developing Flat Plate Turbulent Boundary Layer at Reynolds Number $Re_H = 13 000$

Nicolas Renard, Sébastien Deck and Pierre Sagaut

............................... 379

Statistics of Single Self-sustaining Attached Eddy in a Turbulent Channel

Yongyun Hwang

.......................................... 391

Scaling the Internal Boundary Layer

Fanxiao Meng, Donald J. Bergstrom and Bing-Chen Wang

.......................................... 399

3D Spatial Correlation Tensor from an L-Shaped SPIV Experiment in the Near Wall Region

Jean-Marc Foucaut, Christophe Cuvier, Sebastien Coudert and Michel Stanislas

.......................................... 405
On Objective and Non-objective Kinematic Flow Classification Criteria ........................................ 419
Ramon S. Martins, Anselmo S. Pereira, Gilmar Mompean, Laurent Thais and Roney L. Thompson

Quantification of the Full Dissipation Tensor from an L-Shaped SPIV Experiment in the Near Wall Region ............. 429
Jean-Marc Foucaut, Christophe Cuvier, Michel Stanislas and William K. George
Progress in Wall Turbulence 2
Understanding and Modelling
Stanislas, M.; Jimenez, J.; Marusic, I. (Eds.)
2016, XI, 439 p. 273 illus., 174 illus. in color., Hardcover
ISBN: 978-3-319-20387-4