

CONTENTS

	Page
High Aspect-Ratio Wings	
D. RECKZEH, H. HANSEN: High Reynolds-Number Windtunnel Testing for the Design of Airbus High-Lift Wings	1
S. MELBER-WILKENDING, G. SCHRAUF, M. RAKOWITZ: Aerodynamic Analysis of Flows with Low Mach and Reynolds-Number under Consideration and Forecast of Transition on the Example of a Glider	9
H. VOLLMERS, W. PUFFERT-MEISSNER, A. SCHRÖDER: Analysis of PIV Flow Measurements behind the ALVAST-Model in High-Lift Configuration ..	17
C. BELLASTRADA, CHR. BREITSAMTER: Effect of Differential Flap Settings on the Wake Vortex Evolution of Large Transport Aircraft	25
S. KAUERTZ, G. NEUWERTH, R. SCHÖLL: Investigations on the Influence of Fins on the Extended Nearfield of a Wing in High-Lift Configuration ..	33
U. HENNE: Application of the PSP Technique in Low Speed Wind Tunnels ...	41
A. GROTE, R. RADESPIEL: Investigation of Tailplane Stall for a Generic Transport Aircraft Configuration	50
TH. STREIT, A. RONZHEIMER, A. BÜSCHER: Numerical Analysis of Transport Aircraft Using Different Wing Tip Devices	59
H. STRÜBER, M. HEPPERLE: Aerodynamic Optimisation of a Flying Wing Transport Aircraft	69
 Low Aspect-Ratio Wings	
A. FURMAN, CHR. BREITSAMTER: Delta Wing Steady Pressure Investigations for Sharp and Rounded Leading Edges	77
A. ALLEN, M. IATROU, A. PECHLOFF, B. LASCHKA: Computation of Delta Wing Flap Oscillations with a Reynolds-Averaged Navier-Stokes Solver	85
A. SCHMID, CHR. BREITSAMTER: Experimental study on the Flowfield of a Delta-Canard-Configuration with Deflected Leading Edge	94

Contents (continued)

Page

A. SCHÜTTE, G. EINARSSON, B. SCHÖNING, A. RAICHLE, TH. ALRUTZ, W. MÖNNICH, J. NEUMANN, J. HEINECKE: Numerical Simulation of Maneuvering Combat Aircraft	103
B. GÖLLING, O. ERNE: Experimental Investigation on Periodic Rolling of a Delta Wing Flow at Transonic Mach Numbers	112
U. HERRMANN: Numerical Design of a Low-Noise High-Lift System for a Supersonic Aircraft	120

Helicopters

F. LE CHUITON: Chimera Simulation of a Complete Helicopter with Rotors as Actuator Discs	128
A. RAICHLE: Extension of the Unstructured TAU-Code for Rotating Flows ..	136
A. STUERMER: Unsteady Euler and Navier-Stokes Simulations of Propellers with the Unstructured DLR TAU-Code	144
S. MELBER-WILKENDING: Aerodynamic Analysis of Jet-Blast Using CFD Considering as Example a Hangar and an AIRBUS A380 Configuration	152

Bluff Bodies

R. ADELI, J.M.A. LONGO, H. EMUNDS: Flow Field Study of a Supersonic Jet Exiting into a Supersonic Stream	160
K.V. KLINKOV, A. ERDI-BETCHI, M. REIN: Behaviour of Supersonic Overexpanded Jets Impinging on Plates	168
A. KOVAR, E. SCHÜLEIN: Study of Supersonic Flow Separation Induced by a Side Jet and its Control	176
J. SRULIJES, F. SEILER: Analytically Obtained Data Compared with Shock Tunnel Heat Flux Measurements at a Conical Body at $M = 6$	184

Contents (continued)

Page

Laminar Flow Control and Transition

A. KRUMBEIN: Navier-Stokes Airfoil Computations with Automatic Transition Prediction using the DLR TAU Code - A Sensitivity Study	192
J. WILD, O.T. SCHMIDT: Prediction of Attachment Line Transition for a High-Lift Wing Based on Two-Dimensional Flow Calculations with RANS- Solver	200
R. WOKOECK, A. GROTE, N. KRIMMELBEIN, J. ORTMANNS, R. RADESPIEL, A. KRUMBEIN: RANS Simulation and Experiments on the Stall Behaviour of a Tailplane Airfoil	208
I. HOEFENER, W. NITSCHE, A. CARNARIUS, F. THIELE: Experimental and Numerical Investigations of Flow Separation and Transition to Turbu- lence in an Axisymmetric Diffuser	217
I. PELTZER, W. NITSCHE: In-Flight and Wind Tunnel Investigations of Instabilities on a Laminar Wing Glove	225
O. MARXEN, U. RIST, D. HENNINGSON: Steady Three-Dimensional Streaks and their Optimal Growth in a Laminar Separation Bubble	233
T. HETSCH, U. RIST: Applicability and Quality of Linear Stability Theory and Linear PSE in Swept Laminar Separation Bubbles	241

Active Flow Control

A. BRUNN, W. NITSCHE: Drag Reduction of an Ahmed Car Model by Means of Active Separation Control at the Rear Vehicle Slant	249
R. PETZ, W. NITSCHE, M. SCHATZ, F. THIELE: Increasing Lift by Means of Active Flow Control on the Flap of a Generic High-Lift Configuration ...	257
P. SCHOLZ, J. ORTMANNS, C.J. KÄHLER, R. RADESPIEL: Influencing the Mixing Process in a Turbulent Boundary Layer by Pulsed Jet Actuators ..	265
B. GÖKSEL, I. RECHENBERG: Active Flow Control by Surface Smooth Plasma Actuators	273

Hypersonic Flows

- M. HAVERMANN, F. SEILER: Boundary Layer Influence on Supersonic Jet/Cross-Flow Interaction in Hypersonic Flow 281
 A. MACK, M. EMRAN, R. SCHÄFER: Numerical rebuilding of a Generic Body-Flap Model in an Arc Heated Facility 289
 U. GAISBAUER, H. KNAUSS, N. N. Fedorova, Y. V. Kharlamova: Experimental and Numerical Investigations of Shock/Turbulent Boundary Layer Interaction on a Double Ramp Configuration 297
 H. LÜDEKE, A. FILIMON: Time Accurate Simulation of Turbulent Nozzle Flow by the DLR TAU-Code 305

- ST. LÖHLE, M. FERTIG, M. AUWETER-KURTZ: Quantitative Comparison of Measured and Numerically Simulated Erosion Rates of SiC Based Heat Shield Materials 313

- O. BOZIC, J.M.A. LONGO, P. GIESE, J. BEHRENS: High-End Concept to Launch Micro-Satellites into Low-Earth-Orbit Based on Combination of a Two-Stage Rocket and a Railgun-System 322

Aeroelasticity

- A. SODA, T. TEFY, R. VOß: Numerical Simulation of Steady and Unsteady Aerodynamics of the WIONA (Wing with Oscillating Nacelle) Configuration 330
 R. VOß, C. HIPPE: Computation of the Flutter Boundary of the NLR 7301 Airfoil in the Transonic Range 338

Aeroacoustics

- M. FISCHER, H. BIELER, R. EMUNDS: The Noise Criteria within Multidisciplinary High-Lift Design 348
 J. ORTMANN, J. WILD: Effect of Noise Reducing Modifications of the Slat on Aerodynamic Properties of the High-Lift System 357

- M. HERR: Experimental Study on Noise Reduction through Trailing Edges Brushes 365
 A. SCHRÖDER, M. HERR, T. LAUKE, U. DIERKSHEIDE: A Study on Trailing Edge Noise Sources Using High-Speed Particle Image Velocimetry 373
 M. BAUER, A. ZEIBIG: Towards the Applicability of the Modified von Kármán Spectrum to Predict Trailing Edge Noise 381
 T.PH. BUI, W. SCHRÖDER, M. MEINKE: Numerical Simulation of Combustion Noise Using Acoustic Perturbation Equations 389

Mathematical Fundamentals / Numerical Simulation

- C.-C. ROSSOW: Toward Efficient Solution of the Compressible Navier-Stokes Equations 397
 A. SHISHKIN, C. WAGNER: Direct Numerical Simulation of a Turbulent Flow Using a Spectral/hp Element Method 405
 B. EISFELD: Numerical Simulation of Aerodynamic Problems with a Reynolds Stress Turbulence Model 413
 N. ALKISHRIWI, M. MEINKE, W. SCHRÖDER: Efficient Large Eddy Simulation of Mach Number Flow 422
 R. HEINRICH: Implementation and Usage of Structured Algorithms within an Unstructured CFD-Code 430
 M. KUNTZ, F. MENTER: Numerical Flow Simulation with Moving Grids ... 438
 TH. RÖBER, D. KOZULOVIC, E. KÜGELER, D. NÜRNBERGER: Appropriate Turbulence Modelling for Turbomachinery Flows Using a Two-Equation Turbulence Model 446
 A.-R. HÜBNER: Numerical Determination of Dynamic Derivatives for Transport Aircraft 455
 A. GURR, H. RIEGER, CHR. BREITSAMTER, F. THIELE: Detached-Eddy Simulation of the Delta Wing of a Generic Aircraft Configuration 463

Contents (continued)

	Page
M. IATROU, CHR. BREITSAMTER, B. LASCHKA: Small Disturbance Navier-Stokes Equations: Application on Transonic Two-Dimensional Flows Around Airfoils	471
G. GÜNTHER, J. PENNECOT, J. BOSBACH, C. WAGNER: Numerical and Experimental Investigations of Turbulent Convection with Separation in Aircraft Cabins	479

Physical Fundamentals

A. SODA, N. VERDON: Investigation of Influence of Different Modelling Parameters on Calculation of Transonic Buffet Phenomena	487
S. JAKIRLIC, K. HANJALIC, C. TROPEA: Anisotropy Evolution in Relaminarizing Turbulent Boundary Layers: a DNS-Aided Second-Moment Closure Analysis	496
N. PELLER, M. MANHART: Turbulent Channel Flow with Periodic Hill Constrictions	504
S. SARIC, S. JAKIRLIC, C. TROPEA: Turbulent Flow Separation Control by Boundary-Layer Forcing: A Computational Study	513

Facilities

I. PHILIPSEN: Implementation of Propeller Simulation Techniques at DNW..	521
--	-----