



Advances in simulation of wing and nacelle stall : results of the closing symposium of the DFG Research Unit FOR 1066, December 1-2, 2014, Braunschweig, Germany /

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Monografía

The book reports on advanced solutions to the problem of simulating wing and nacelle stall, as presented and discussed by internationally recognized researchers at the Closing Symposium of the DFG Research Unit FOR 1066. Reliable simulations of flow separation on airfoils, wings and powered engine nacelles at high Reynolds numbers represent great challenges in defining suitable mathematical models, computing numerically accurate solutions and providing comprehensive experimental data for the validation of numerical simulations. Additional problems arise from the need to consider airframe-engine interactions and inhomogeneous onset flow conditions, as real aircraft operate in atmospheric environments with often-large distortions. The findings of fundamental and applied research into these and other related issues are reported in detail in this book, which targets all readers, academics and professionals alike, interested in the development of advanced computational fluid dynamics modeling for the simulation of complex aircraft flows with flow separation

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Contenido: The Delay of RANS-to-LES Transition in Hybrid RANS-LES Approaches and Some Recently Proposed Remedies -- Computations of Separated Flows with a Hybrid RANS/LES Approach -- Hybrid RANS /LES Study of the Development of an Airfoil-Generated Vortex -- Interaction of Three-Dimensional Disturbances with the Flow around a Two-Element High-Lift Airfoil -- The Discontinuous Galerkin Method as an Enabling Technology for DNS and LES of Industrial Aeronautical Applications -- Body Force Modelling of Internal Geometry for Jet Noise Prediction -- Numerical Studies of Turbulent Flow Influence on a Two-Element Airfoil -- CFD for Prediction of Flow Separation from Aircraft Tail Surfaces -- Zonal RANS-LES Computation for Near-Stall-Airfoil Flow -- Criteria for Crosswind Variations during Approach and Touchdown at Airports -- Development and Improvement of Two Methods of Different Complexity to Simulate Atmospheric Boundary Layer Turbulence for Aircraft Design Studies -- Simulation of Interaction of Aircraft with Gust and Resolved LES-Simulated Atmospheric Turbulence -- A New Method to Generate Anisotropic Synthetic Turbulence for LES -- Numerical Simulation of the Turbulent Flow Around a Wing -- Integration- and Intake-Induced Flow Distortions and their Impact on Aerodynamic Fan Performance -- Flow Investigations in a Stalling Nacelle Inlet Under Disturbed Inflow -- Realistic Inlet Distortion Patterns Interacting with a Transonic Compressor Stage -- Unsteady CFD Simulation of Transonic Axial Compressor Stages with Distorted Inflow -- Transitional Shock-Wave /Boundary-Layer Interactions in Intakes at Incidence.-Advanced Design Approach for a High-lift Wind Tunnel Model Based on Flight Test Data -- Simulation of Longitudinal Vortices on a High-LiftWing -- Impact of Different UHBR-Engine Positions on the Aerodynamics of a High-LiftWing -- Numerical Investigation of the Influence of Pressure Belts on the Stall of a Transport Aircraft in Landing Configuration -- Numerical Studies of Active Flow Control Applied at the Engine-Wing Junction

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