STS 20

Flow Separation Induced by Strong Interactions

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Session Abstract

Keywords: *Separation, strong disturbances, shock wave, compression, boundary layer, shockwave-boundary layer interaction*

Flow separation depreciates flow quality and increases drag and losses. Strong interactions may be induced by flow itself, as shock waves or rapid compressions. But such interactions may be also induced by bounding walls shape as upstream or downstream facing steps, sharp corners and leading or trailing edges.

Proposed here topic includes flow control methods aimed at separation reduction or its elimination. Flow control methods and their physical mechanisms are important topics of the STS session. Physical modelling of the flow control methods are important to simplify their inclusion in CFD approach to separated flow analysis.

This STS "Flow Separation Induced by Strong Interactions" will include five papers, addressing different aspect of the theme.

References:

[1]   P. Doerffer (Editor), *UFAST Experiments – Data Bank*, IMP PAN Publishers, ISBN 978-83-88237-46-1, 2009

[2]   P. Doerffer (Editor), *Unsteady Effects in Shock Wave Induced Separation*, Springer series – Notes on Numerical Fluid Mechanics and Multidisciplinary Design (NNFM114), Springer, ISBN 978-3-642-03003-1, 2009

[3]   P. Doerffer (Editor), *Recent Progress in Flow Control for Practical Flows, Results of the STADYWICO and IMESCON Projects*, Springer, DOI: 10.1007/978-3-319-50568-8, 2017

Foreseen paper titles and speakers:

Transition Location Effect on Shock Wave Boundary Layer Interaction – Lessons Learnt from the EU Project TFAST *(20 min.)*
Piotr Doerffer, Institute of Fluid Flow Machinery, IMP PAN, Gdańsk, Poland

High-resolution Unsteady Simulations of Transitional Shock Wave / Boundary Layer Interactions *(25 min.)*
Lionel Larchevêque, Aix Marseille Univ., CNRS, IUSTI, Marseille, France
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Numerical Simulation of a 3-D Transonic Regime around a Supercritical Wing Involving Strong Separation *(25 min.)*
N. Simiriotis (1), Damian Szubert (1, 2), I. Asproulias (1), J.B. Tô (1), Y. Hoarau (3), Marianna Braza (1)
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Parametric Study of Multiple Shock Wave/Turbulent Boundary Layer Interactions with a Reynolds Stress Model *(25 min.)*
K. Boychev, G.N. Barakos, R. Steijl, CFD Laboratory, School of Engineering, University of Glasgow, UK
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Numerical Simulation for Shock Wave Induced Separation on Gas Turbine Profile with Film Cooling *(25 min.)*
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