HiFiLeD SYMPOSIUM

High-Fidelity Industrial LES/DNS Symposium

Paving the Way for Future Accurate CFD

THIRD ANNOUNCEMENT

14-16 November 2018, Brussels, Belgium

supported by the EU H2020 TILDA ⬛ project[1]

HiFiLeD Symposium objectives[2]

The simulation of turbulent flows using CFD methods has progressed rapidly over the last decades and has given rise to significant changes in the design processes of many areas of fluid mechanics. However, despite over a century of research, the modelling of turbulence and transition in industrial relevant configurations is still far from being achieved successfully.

With the advent and growing availability of large scale computing power and facilities, a new area of turbulence research is opening with the ability to perform reliable high-fidelity large-eddy simulations (LES) and direct numerical simulations (DNS) for industrial relevant flow configurations.

This availability is opening exciting new avenues towards understanding and modeling turbulence and transition by:

i. Direct generation of HiFiLeD to fully predict complex flows, by capturing most or all of the relevant turbulent scales and interactions

ii. Analyzing in depth the underlying physics, supported in particular by new technologies of Machine Learning

iii. Confronting available turbulence and transition models, identifying their deficiencies, improving the range of validity of current models and generate new ones.

This novel approach of High-Fidelity LES/DNS data has attracted many researchers in recent years, stimulated by other emerging areas, as Big Data, Artificial Intelligence (AI) and Machine Learning (ML), providing new efficient methodologies for interrogating and investigating very large data sets.

These topics of turbulence research are the main focus of this new HiFiLeD Symposium

The HiFiLeD Symposium will be focusing on all aspects related to these objectives, ranging from issues concerning the complexity, reliability, accuracy and uncertainties in generating the HiFiLeD data, to their application towards turbulence and transition modelling. It will include progress on the underlying high-order numerical methods (HOMs), innovative approaches for CPU acceleration for LES and DNS, exploitation of massive parallel architectures, efficient post-processing on massive parallel hardware, as well as experimental data. Moreover, the

Symposium offers the opportunity to communicate and exchange knowledge for academic researchers, graduate students, industrial engineers, as well as industrial R&D managers and consultants working in the

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fields of turbulent flow modelling, simulations, measurements and multidisciplinary CFD applications.

Call for Contributions

Contributions by participants are expected on the following topics, either as presentation, or as organizer of a Mini-Symposium:

- Understanding Turbulence and Transition from HiFiLeD
- Understanding Turbulence and Transition from new experimental data
- Advances in Turbulence and Transition modelling, based on LES/DNS databases
- Machine Learning applications to LES/DNS analysis and modelling
- New LES/DNS data for reference configurations
- Applications of high fidelity LES/DNS to industrial configurations
- Algorithmic and modelling issues for LES simulations, including Wall Modelled LES (WMLES)
- Advances in high-order methods, including curved grid generation
- HPC related issues on multiple platforms (CPU/GPU)

Abstract submission

An abstract (1-2 page(s) max.) is requested with the **ultimate deadline** being **14 October 2018**.

Acceptance to present will be notified **by end of October 2018**.

Keynote speakers

Karthik Duraisamy, University of Michigan, USA: Machine Learning for Turbulence Modelling: Progress, Challenges and Opportunities for Future Research

Philippe Spalart, Boeing, USA: How does knowledge from DNS enter RANS models?

Maria Vittoria Salvetti, Univ. Pisa, Italy: Assessment of accuracy and reliability of LES for complex applications: deterministic vs. stochastic approaches

Paul Tucker, Univ. Cambridge, UK: Challenges and requirements of eddy resolving simulations in turbomachinery

Mujeeb R. Malik, NASA, USA: WRLES and WMLES of RCA Standard Test Cases

Location: Belgium, Brussels, Thon Hotel EU

Hotel and travel information are available on the Symposium web site; see below.

Date: 14th to 16th November 2018

Symposium fee

The **symposium fee** is **450€** - and will contain a booklet-of-abstracts, coffee breaks, lunches and a symposium dinner.

For **Students** and **TILDA partners** a reduced fee of **350€** applies.

Registration

Registration to the symposium can be carried out via the HiFiLeD Symposium web site: https://hifiled-symposium.eu - or by scanning the QR-Code ➔

For further information, please contact the Local Organising Committee members

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Scientific Committee

R. Baier (MTU), F. Bassi (Univ. Bergamo), S. Bosniakov (TsAGI), J.F. Boussuge (CERFACS), F. Chalot (Dassault Aviation), A. Colombo (Univ. Bergamo), V. Couaillier (ONERA), M. de la Llave Plata (ONERA), R. Hartmann (DLR), C. Hirsch (NUMECA), H.T. Huynh (NASA), W. Haase (whac), K. Hillewaert (CENAERO), M.R. Malik (NASA), F. Menter (ANSYS), S. Mouriaux (SAFRAN), J.F. Remacle (Univ. Louvain), C.L. Rumsey (NASA), P. Spalart (Boeing), M. Strelets (NTS), L. Tourette (Airbus), J.W. van der Burg (Airbus), A. Wolkov (TsAGI), Z. Xiao (Tsinghua Univ.)

The HiFiLeD symposium is organized with support from the Associations