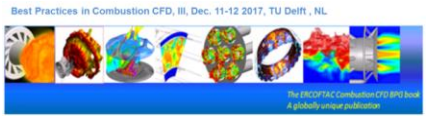
Best practices guidelines for CFD of turbulent combustion including emission prediction and virtual prototyping



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Monday, December 11, 2017

Day 1: Best practices guidelines for CFD of turbulent combustion

8:30	**Registration and welcome**	
9:00	**Turbulent combustion modeling**	**Luc Vervisch**
10:00	**Chemistry reduction for CFD**	**Luc Vervisch**
10:30	**Refreshments**	
11:00	**Turbulent spray combustion**	**Dirk Roekaerts**
12:00	Discussion	
12:30	**Lunch**	
13:30	**Modeling soot formation and destruction**	**Stelios Rigopoulos**
14:30	**Integration of soot models in CFD of turbulent combustion**	**Stelios Rigopoulos**
15:30	**Refreshments**	
16:00	**Best practices in CFD of thermal radiative heat transfer**	**Dirk Roekaerts**
17:00	**Final discussion**	
17:30	**Close**	

Evening: course dinner

Tuesday, December 12, 2017

Day 2: CFD at work: validated models, prototyping, emission modeling

8:30	**Registration and welcome**	
9:00	**LES and RANS best practice for model validation part 1**	**Michael Pfitzner**
10:00	**LES and RANS best practice for model validation part 2**	**Michael Pfitzner**
11:00	**Refreshments**	
11:30	**Virtual prototyping of combustion systems**	**Luc Vervisch**
12:30	**Lunch**	
13:30	**Gas turbine emission modeling using CFD with chemical reactor networks**	**Arvind Gangoli Rao**
14:30	**Mini workshop on combustion CFD applications:** Participants and lecturers are invited to give a short presentation on a combustion CFD application using the CFD tools of their interest, with emphasis on challenging issues. The discussion will focus on which best practices can be identified for the presented cases.	Dirk Roekaerts (chairman)
16:00	**Final conclusions and closure**	

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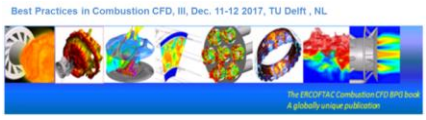

Background and objectives:

Design and operation of modern combustion systems (gas turbine engines, IC engines, process furnaces) faces the need to combine high efficiency with low pollutants emissions. Computational Fluid Dynamics has become a powerful tool in design of these systems. Many numerical models exist, each having a range of applicability, computational cost and accuracy. Consequently, CFD experts involved in combustor simulations, in addition to usual CFD skills, need specific insight and knowledge in combustion, heat transfer and emission modelling in order to conduct thorough analysis. The present course addresses this need.

The participants will learn the best practices in CFD of combustion systems. They will discover how to select models, how to validate numerical simulations, and which accuracy to expect. Interactions between fuel injection, turbulence, heat release and thermal radiation are critical in determining flame structure and pollutant emissions, and a major part of the course is devoted to them.

The lectures of this course, all by well-known experts in the field, cover from basics to applications.

The course is partially based on the ERCOFTAC Best Practice Guide on CFD of combustion, a copy of which will be provided to the participants.

In the course also the link will be made with the CFD programs and cases of interest for the participants. As a result, the course provides the means for CFD analysts to significantly enhance their use of commercial and open-source CFD software for combustion engineering applications.

Lecturers:

Prof. Michael Pfitzner, Universität der Bundeswehr München, Germany
Dr. Arvind Gangoli Rao, Delft University of Technology, The Netherlands
Dr. Stelios Rigopoulos, Imperial College London, United Kingdom
Prof. Dirk Roekaerts, Delft University of Technology, The Netherlands
Prof. Luc Vervisch, National Institute of Applied Sciences, Rouen Normandy University, France

Fees:
ERCOFTAC Members €570 , Non-members €850
Students : €410

Please note each delegate will receive a free copy of the BPG Combustion CFD book

Please note Course fees do NOT include accommodation

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