

- ☐ INTRODUCTION TO MEASUREMENT TECHNIQUES
OCTOBER 7-11, 2013
- ☐ ADVANCED POST-PROCESSING OF EXPERIMENTAL AND NUMERICAL DATA
NOVEMBER 4-7, 2013
- ☐ FLUID MECHANICS AND CHEMISTRY FOR SAFETY ISSUES IN HLM NUCLEAR REACTORS
NOVEMBER 25-27, 2013
- ☐ 37TH ADVANCED VKI CFD LECTURE SERIES: RECENT DEVELOPMENTS IN HIGHER ORDER METHODS AND INDUSTRIAL APPLICATION IN AERONAUTICS
DECEMBER 9-12, 2013
- ☐ INTRODUCTION TO COMPUTATIONAL FLUID DYNAMICS
JANUARY 20-24, 2014
- ☐ HYPersonic FLIGHT TESTING (VKI-STO-AVT-234)
MARCH 24-28, 2014
- ☐ INTRODUCTION TO OPTIMIZATION AND MULTIDISCIPLINARY DESIGN IN AERONAUTICS AND TURBOMACHINERY
APRIL 7-11, 2014
- ☒ LARGE EDDY SIMULATION - THEORY AND APPLICATIONS
MAY 5-9, 2014
- ☐ SPECTROSCOPY AND SPECTROSCOPIC MEASUREMENT TECHNIQUES FOR AEROSPACE FLOWS
MAY 13-16, 2014
- ☐ SMALL AEROPLANE DESIGN
MAY 20-22, 2014
- ☐ UNCERTAINTY QUANTIFICATION IN COMPUTATIONAL FLUID DYNAMICS (VKI-STO-AVT-235) AT STANFORD, CALIFORNIA
MAY 26-27, 2014
- ☐ PROGRESS IN FLOW INSTABILITY ANALYSIS AND LAMINAR-TURBULENT TRANSITION MODELING
JUNE 2-6, 2014
- ☐ PHYSICS OF SLOSHING LIQUIDS: EXPERIMENTS AND MODELING
SEPTEMBER 1-5, 2014
- ☐ UNCERTAINTY QUANTIFICATION IN COMPUTATIONAL FLUID DYNAMICS (VKI-STO-AVT-235)
SEPTEMBER 22-26, 2014

ONLINE REGISTRATION AVAILABLE

<https://www.vki.ac.be/registration>

It is highly recommended that the registration is sent at the latest 15 days before the beginning of the course. A letter of acceptance and additional information will be sent on receipt of the application form.

COURSE FEE (5 days)

VAT included	Type 1 (€)	Type 2 (€)	Type 3 (€)
Normal Fee	1350	1760	1920
PhD Candidate Fee **	675	675	960
Undergraduate Student Fee **	300	300	400

Type 1: Permanent residents of NATO countries funding VKI: Belgium, Czech Rep., France, Germany, Hungary, Iceland, Italy, Luxembourg, Norway, Portugal, Spain and Turkey

Type 2: Permanent residents of NATO countries not funding VKI or NATO partner countries

Type 3: Permanent residents of non-NATO countries

**** The request to be considered for an award must accompany the application to attend the Lecture Series, and the applicant must provide a recommendation letter from his or her professor; if not done so, the request will not be taken into consideration. All possible alternative sources of funding should be investigated before aid is requested under this scheme, so that those most in need will benefit.**

REDUCTION

-50% for the 3rd & 4th participant of the same company.

The fee includes printed notes, lunches, beverages, and administrative costs.

von Karman Institute for Fluid Dynamics
Waterloosesteenweg 72
1640 Sint-Genesius-Rode, Belgium

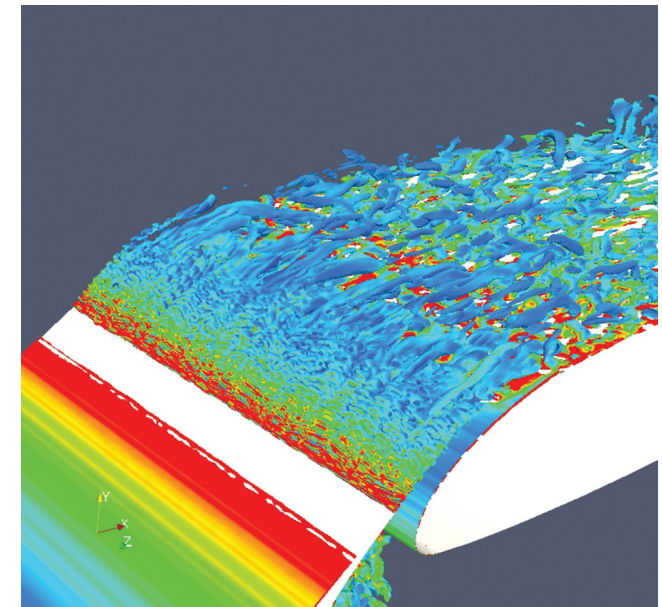
Phone: +32(0)2 359 96 04, Fax: +32(0)2 359 96 00
E-mail: secretariat@vki.ac.be, Website:
<https://www.vki.ac.be>, TVA BE 0407 185 709



von KARMAN INSTITUTE
FOR FLUID DYNAMICS

LARGE EDDY SIMULATION AND RELATED TECHNIQUES

THEORY AND APPLICATIONS



Large Eddy Simulation of slat-airfoil interaction.
Q iso-structures. VALIANT EU-FP7 project

May 5-9, 2014

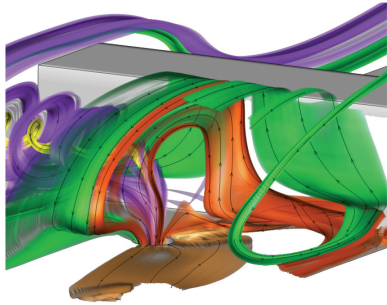


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INTRODUCTION

The purpose of this Lecture Series is to offer a full overview of the present development and the potential of the Large Eddy Simulation (LES) of turbulent flows. The first part of the course will introduce and discuss fundamental principles, present state-of-the-art applications and possible developments of LES and Detached Eddy Simulation (DES) which represents the most promising technique to extend the usefulness of LES for high Reynolds-number flows. A real-time



Mean flow topology in ribbed duct. Effect of aspirating hole;

demonstration showing how to set up, execute and assess an LES of a wall-bounded flow will be carried out.

The second part will present applications of these approaches to various engineering fields of wide interest. The course will be delivered by internationally recognized experts. Its content is addressed both to researchers interested in the fundamental simulation of turbulence and engineers wanting to apply the LES technique or LES solvers to the accurate simulations of turbulent flows.

The Lecture Series Directors are Prof. U. Piomelli, Queen's University, Canada, and Prof. Benocci and Prof. Van Beeck from the von Karman Institute.



VON KARMAN INSTITUTE
FOR FLUID DYNAMICS

VON KARMAN INSTITUTE

VKI is a non-profit international educational and scientific organisation, hosting 3 departments (aeronautics and aerospace, environmental and applied fluid dynamics, and turbomachinery & propulsion). It provides post-graduate education in fluid dynamics (research master in fluid dynamics, former "VKI Diploma Course", doctoral program, short training program and lecture series) and encourages "training in research through research". The von Karman Institute undertakes and promotes research in the field of fluid dynamics.

It possesses about fifty different wind tunnels, turbomachinery and other specialized test facilities, some of which are unique or the largest in the world.

The VKI organizes each year about 12 one-week Lecture Series on specialized topics in the field of aerodynamics, fluid mechanics and heat transfer with application to aeronautics, space, turbomachinery, the environment and industrial fluid dynamics.

PROGRAM SCHEDULE

MONDAY 5 May 2014

- 08:45 Registration
- 09:15 Welcome
- 09:30 Large Eddy and Direct Simulation of Turbulent Flows
Pr. U. Piomelli, Queen's University, Ontario, Canada
- 10:45 Coffee Break
- 11:15 Large Eddy and Direct Simulation of Turbulent Flows
Pr. U. Piomelli
- 12:30 Lunch
- 14:00 Large Eddy and Direct Simulation of Turbulent Flows
Pr. U. Piomelli
- 15:15 Coffee break
- 15:45 Large Eddy and Direct Simulation of Turbulent Flows
Pr. U. Piomelli
- 17:00 Reception

TUESDAY 6 May 2014

- 09:00 Large Eddy and Direct Simulation of Turbulent Flows
Pr. U. Piomelli
- 10:30 Coffee Break
- 11:00 Large Eddy and Direct Simulation of Turbulent Flows
Pr. U. Piomelli
- 12:30 Lunch

- 14:00 Numerical Implementation of Large Eddy Simulation
Pr. P. Sagaut, Université Pierre et Marie Curie-Paris, France
- 15:15 Coffee Break
- 15:45 Numerical Implementation of Large Eddy Simulation
Pr. P. Sagaut

WEDNESDAY 7 May 2014

- 09:00 Detached Eddy Simulation
Pr. K. Squires, Arizona State University, USA
- 10:30 Coffee Break
- 11:00 Detached Eddy Simulation
Pr. K. Squires
- 12:30 Lunch
- 14:00 Detached Eddy Simulation
Pr. K. Squires
- 15:15 Coffee Break
- 15:45 Detached Eddy Simulation
Pr. K. Squires

THURSDAY 8 May 2014

- 09:00 Applications of Large Eddy Simulation and Direct Simulation to Biological Flows
Pr. E. Balaras, The George Washington University, USA
- 10:30 Coffee Break

- 11:00 Applications of Large Eddy Simulation and Direct Simulation to Biological Flows
Pr. E. Balaras
- 12:30 Lunch
- 14:00 Immersed Boundary Technique for Large Eddy Simulation
Pr. R. Verzicco, Università degli Studi di Roma "Tor Vergata", Italy
- 15:15 Coffee Break
- 15:45 Immersed Boundary Technique for Large Eddy Simulation
Pr. R. Verzicco

FRIDAY 9 May 2014

- 09:00 Applications of Large Eddy Simulation to Atmospheric Flows
Pr. F. Porté-Agel, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
- 10:30 Coffee Break
- 11:00 Applications of Large Eddy Simulation to Atmospheric Flows
Pr. F. Porté-Agel
- 12:30 Lunch
- 14:00 End of Lecture Series