

**IUTAM Symposium « Unsteady Separated Flows »
Toulouse, France, 8-12 April '02**

Detailed programme

(Some slight changes could occur until the symposium date)

Monday 8th April 2002 :

- 9:00 - 10:30 Registration
- 10:30 - 12:00 Welcome address :
The chairmen of the IUTAM Symposium: M. Braza, Ch. Hirsch, F. Hussain
The IUTAM Bureau representative, Prof. C. Cercignani
The President of the Institut National Polytechnique de Toulouse, the Director of ENSEEIHT (Ecole Nationale Supérieure d'Electrotechnique, Electronique, Informatique et Hydraulique de Toulouse)
The Director of the Institut de Mécanique des Fluides de Toulouse
Presentations of INPT, ENSEEIHT, IMFT institutions and of the research activities of IMFT. Presentation of the wind tunnel facilities and historical overview – H. Boisson, research group EMT2 “Ecoulements Monophasiques, transitionnels et Turbulents of IMFT.
- 11:45 - 13:45 Lunch
- 13:45 - 14:30** **P. Bearman & G. Owen. Imperial College, U.K. Opening lecture**
Experimental studies of the unsteady three-dimensional separated flow around bluff bodies
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- 14:30 - 18:25 **Session A, chaired by C. Norberg** (Lund Institute of Technology - Sweden):
Experimental Techniques for a better understanding of the dynamics of separation
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- 14:30 - 14:50 **T.Weier, G. Gerbeth, G. Mutschke, O. Lielausis, G. Lammers** (Germany- Latvia)
Control of flow separation using electromagnetic forces
- 14:50 - 15:10 **H. Djeridi, M. Braza, R. Perrin, G. Harran, E. Cid, S. Cazin** (France) : Near-wake turbulence properties around a circular cylinder at high Reynolds number
- 15:10 – 15:55** **T. Sarpkaya, Naval Postgraduate School, Monterey, U.S.A. Key-note lecture**

Taylor-Görtler instability and separation on a cylinder in sinusoidally oscillating flow

- 15:55 - 16h15 **M.J. Esteve & P. Millan** (France)
Experimental characterization of the flow within different rectangular cavities. Role played by the shear layer
- 16:15 - 16:35 **Sejeong Jeon, Jinil Park, Woo Puyng Jeon, Haecheon Choi** (Korea)
Active control of flow over a sphere for drag reduction
- 16:35 – 16:55 Coffee break
Posters displayed from Monday to Wednesday during coffee breaks:
- 16:55 – 17:40** **C.H.K. Williamson & R. Govardhan**, Cornell Univ., U.S.A. **Key-note lecture**
Unsteady separated flow modes due to vortex-induced vibration
- 17:40 - 18h00 **J. Carberry, J. Sheridan, D. Rockwell** (U.S.A.-Australia)
Cylinder oscillations beneath a free surface
- 18:00 – 18:20 **K.B. Skaugset & C.M. Larsen**
Direct Numerical Simulation and Experimental Investigation on Vortex Shedding and VIV Modification Using Radial Water Jets along a Circular Cylinder"

Posters of this session (presented during coffee breaks from Monday to Wednesday) :

A. Spohn & P. Gillieron (France)
Flow separations generated by a simplified geometry of an automotive vehicle

Y. L. Lau, R. M. C. So, R. C. K. Leung (Hong Kong)
Coupled flow-induced vibration of a cylinder/plate system

O.N. Ramesh & H.P. Hodson (India - U.K.)
Effect of roughness on unsteady separation over a high lift aerofoil

T. G. Elizarova , I. S. Kalachinskaya, R. Weber , J. Hureau, J.-C. Lengrand (Russia – France)
Backward-facing step flow. Experimental and numerical approach

X.L. Xie, W.W. Ma, H.L. Zhou (P.R China)
Experimental Study of Parameter Evolutions and Spatiotemporal Correlations of Counter-axial Shear Flows

X.L. Xie, W.W. Ma, H.L. Zhou (P.R China)
Compared Study of Dynamical Behaviors of Counter- and Co-axial
Shear Flows

J.F. Largeau, V. Morinière, J. Peube (France)
Experimental investigation of flow over a forward-facing step

19:05

Cocktail offered by the City Hall (Mairie de Toulouse), Place du
Capitole, Salle des Illustres.

Tuesday, 9 April 2002 :

8:55-12:15 **Session B, chaired by S. Cowley** (DAMTP, Univ. of Cambridge, U.K.) :
Theoretical aspects of flow separation and analytical approaches

8:55 - 9:40 **A. Ruban, University of Manchester, U.K. Key-note lecture**
Collision phenomena in interactive and classical boundary layers

9:40 - 10:00 **R.I. Bowles, F.T. Smith, C. Davies** (U.K.)
On the effects of the adverse pressure gradients in boundary layer separation

10:00 -10:20 **Linzhong Li & F.T. Smith** (U.K.)
Computation on unsteady separating slender flows

10:20 - 10:50 Coffee break
Posters will be displayed from Tuesday to Thursday

10:50 -11:35 **J.D.A. Walker, Lehigh University, Bethlehem PA, U.S.A.**
Key-note lecture
Unsteady separation processes at high Reynolds number and their control

11:35 - 11:55 **B. Pier** (U.K.)
Periodic vortex shedding from obstacles: theoretical prediction of the Strouhal number

11:55 – 12:15 **G. Haller, Yong Wang, Hayder Salman** (USA)
Control of Lagrangian Coherent Structures

Posters of this session:

J.Ph. Brazier, S. Méloüs, J. Perraud (France)
Stability analysis of the flow past a flap edge with a fence

E. Amromin, S. Kovinskaya, V. Sofronov (USA – Russia)
Unsteady separated flow on bottom of shipping channels

J.S.B. Gajjar (U.K.)
Navier-Stokes computations for the flow past a cascade of cylinders at large Reynolds numbers

12:15 - 14:00 Lunch

14:00 - 18:20 **Session C , chaired by G. Karniadakis** (Brown Univ, USA) :
Instability and Transition studies related to the onset of separation and to its control

14:00 -14:45 P. Huerre, Ecole Polytechnique, France. **Key-note lecture**
Nonlinear periodic states and local resonance in separated wake flows

14:45 - 15:05 **D.J. Olinger, M.A. Demetriou, G. Balasubramanian, M.P. Davies** (USA)
Low-order modeling of cylinder wakes

15:05 - 15:25 **O. Rediniotis**
Synthetic jet actuators for realistic separation control applications

15:25 - 15:45 **S.J. Sherwin, I. Robertson, P.W. Bearman** (U.K.)
Prediction of fluid/structure interaction for rotating and translating bluff bodies

15:45 - 16:15 Coffee break
Posters displayed during coffee break from Tuesday to Thursday:

16:15 - 17:00 M. Triantafyllou, MIT, USA, **Key-note lecture**
Separation and turbulence control in biomimetic flows

17:00 - 17:20 **Seung-Jin Baek & Hyung Jin Shung** (Korea)
Feedback control of a circular cylinder wake with rotational oscillations

17:20 - 17:40 **Y. Hoarau, D. Faghani, M. Braza, R. Perrin, D. Anne-Archard, D. Ruiz** (France); Direct Numerical Simulation of the three-dimensional transition to turbulence in the incompressible flow around a wing

17:40 - 18:00 **M. Lang, O. Marxen, U. Rist, S. Wagner** (Germany)
A combined experimental /numerical study of unsteady phenomena in a laminar separation bubble

18:00 - 18:20 **A. Miliou, S.J., Sherwin And J.M.R Graham** (U.K.)
Wake topology of curved cylinders at low Reynolds number

Posters of this session:

S. Mittal (India)

Instabilities in uniform flow past a rotating cylinder

Wednesday 10 April 2002 :

9:00 - 12:00 **Session D, chaired by J. P. Dussauge** (IUSTI-Marseille, France) :
Compressibility effects related to unsteady separation

- 9:00-9:25** **J.D.A. Walker**, Lehigh University, U.S.A. invited review lecture
Supersonic boundary-layer separation and the influence of a compliant surface
- 9:25 - 9:45 **Anh Thi Nguyen, H. Deniau, S. Girard, T. Alziary de Roquefort** (France)
Unsteadiness of flow separation in an over-expanded supersonic nozzle
- 9:45 - 10 :05 **J. Ch. Robinet** (France)
Convective-absolute transition on compressible non isothermal shear layers
- 10:05 - 10:25 **S. Bourdet, A. Bouhadji, M. Braza, F. Thiele** (France-Germany-Canada)
Direct Numerical Simulation of three-dimensional transition to turbulence in the transonic flow around a wing
- 10:25 - 10:55 Coffee break
Posters will be displayed Wednesday and Thursday.
- 10 :55 - 11:15 **D. Caruana, A. Mignosi, M. Corrège, C. Robitailié** (France)
Separated flow and buffet control
- 11 :15 - 11:35 **P. Dupont, J.F. Debiève** (France)
Unsteadiness in a separated shock boundary layer interaction
- 11 :35 - 11:55 **C. Pilinski, A. Nebbache** (France)
Unsteady separated two-throat nozzle flow

Posters of this session:

F. Scarano & Bas van Oudheusden (The Netherlands)
PIV investigation of unsteady behaviour in a compressible base flow

G.S. Cohen & F. Motallebi (U.K.)
Control of shock-induced separation by sub boundary layer vortex generators

A. Kourta & R. Sauvage (France)
Computation of compressible mixing layer

Y. Hoarau, B. Koobus, M. Braza, A. Dervieux (France)

Large Eddy Simulation of shock reflection with TVD shock capturing and high order filter

12:00-13:45

Lunch

14h00-15h00

Committee for best poster award

Afternoon free

Possibility for a visit of IMFT (Institut de Mécanique des Fluides de Toulouse) on request (inscriptions at the registration desk).

19h30 :

Gala dinner, Hôtel-Dieu, Toulouse
(and attribution of the best poster award)

Thursday, 11 April 2002 :

09:00-12:15 **Session E , chaired by W. Rodi** (Institut for Hydromechanics, Univ. Karlsruhe, Germany)
Statistical Turbulence Modelling (RANS) and hybrid approaches (RANS-LES) for unsteady separation prediction

9:00- 9:45 **Lauder, B.** UMIST, U.K. **Key-note lecture**
Some principles for modelling turbulent separated flows

9:45 - 10:05 **E. Goncalves, F. Furlano, R. Houdeville, E. Coustols** (France)
Unsteady RANS computations: simulation of the buffeting over an airfoil

10h05-10h25 **Y. Hoarau, M. Braza, P. Rodes, G. Tzabiras, C. Allain, E. Berton, D. Favier, C. Maresca** (France)
Turbulence modelling of unsteady aerodynamic flows with a pronounced periodic character

10h25-10h45 **E. Guilmineau and P. Queutey** (France)
Numerical simulation of turbulent unsteady separated flow around a square cross-section cylinder in the proximity of a solid wall"

10h45-11h10 Coffee break
Posters of this session will be displayed from Wednesday until the end of the symposium (in respect to the election of best poster date)

11h10-11h35 **P. Spalart, Boeing Co, Seattle, USA ; invited review lecture**
Grid Design for Detached-Eddy Simulations

11h35-11h55 **S. Schmidt and F. Thiele** (Australia-Germany)
Detached eddy simulation of airfoil flow

11h55-12h15 **M. Baragona and H. Bijl** (The Netherlands)
Bubble bursting and unsteady laminar separation

Posters of this session:

S. Tardu and P. da Costa (France)

Experiments and modeling of turbulent wall flows subjected to imposed velocity oscillations with and without adverse pressure gradient

12:15-14:00

Lunch

14:00 - 18:00 **Session F, chaired by B.J. Geurts** (Univ. Twente, The Netherlands) :
Direct and Large-Eddy Simulation of unsteady separated flows

14:00 - 14:45 U. Piomelli, & E. Balaras Univ. of Maryland, USA ; **Key-note lecture**
Direct numerical simulation of wake-induced transition in flat-plate boundary layers

14:45 – 15:05 **J. Neumann & H. Wengle** (Germany)
DNS and LES of passively controlled turbulent backward-facing step flow

15:05 - 15:25 **Dongjoo Kim, Giwoong Yun & Haecheon Choi** (Korea)
Large eddy simulation of turbulent flow over a sphere

15:25 - 15:45 **J.G. Wissink & W. Rodi** (Germany)
DNS of a laminar separation bubble in the presence of oscillating inflow

15:45 - 16:05 **V. Butty, I. Chatziprodromou, Y. Ventikos, V. Makhijani, D.Poulikakos** (Switzerland)
The Effect of pulsatility on the haemodynamics of anatomically accurate arterial flows with aneurysms.

16:05 - 16:35 Coffee break
Posters of this session will be displayed from Wednesday until the end of the symposium (in respect to the election of best poster date)

16:35-17:20 K. Hourigan , P. Reichl, M. Thompson Monash Univ. Australia.
Key-note lecture
The Unsteady Wake of a Circular Cylinder near a Free Surface

17:20-17:40 **P. Ploumhans, G. Daeninck, G. Winckelmans** (Belgium)
Simulation of three-dimensional bluff-body flows using the vortex particle and boundary element methods

17:40-18:00 **A. Abba, C. Cercignani, L. Valdetaro** (Italy)
Large eddy simulation of turbulent obstacle flow

Posters of this session :

D.G.E. Grigoriadis, J.G. Bartzis, A. Goulas (Greece)

Efficient large eddy simulations of turbulent flows using the immersed boundary concept

V.A. Gushchin, A.V. Kostomarov, P.V. Matyushin, E.R. Pavlyukova (Russia)

Direct numerical simulation of unsteady separated fluid flows around a sphere

E. Creusé, I. Mortazavi (France)

Study and manipulation of vortex flows over steps

Friday, 12 April 2002 :

8:45 - 15:30 **Session G, chaired by Dr W. Haase** (EADS–München, Germany): *Prediction of separated flows in unsteady aerodynamics, a sound basis for interdisciplinary applications ; Industrial technology session*

- 8:45 - 9:30** **P. Spalart, L.Hedges, M. Shur, A. Travin** Key note lecture (Boeing Commercial Airplanes, USA – Federal Scientific Center, Russia) *Simulation of Active Flow Control on a Stalled Airfoil*
- 9:30 - 9:50 **M. Strelets** (Federal Scientific Center "Applied Chemistry", Russia) Detached Eddy Simulation of Massively Separated Flows
- 9:50 -10:10 **F. Chalot and M. Ravachol** (Dassault, France) LES Calculations using unstructured grids
- 10:10 - 10:40 Coffee Break
- 10:40-11:00 **M. Henshaw** (BAE Systems, UK) An overview of the industrial requirements for modelling and simulating unsteady separated flows
- 11:00 - 11:20 **T. Rung, F. Thiele, U. Bunge, A. Orellano** (Bombardier-T.U. Berlin, Germany): Rational Approaches Towards Engineering Turbulence Modelling - An Industrial Perspective
- 11:20-12:05 **N. Satofuka, Kyoto Institute of Technology.** Key note lecture *Numerical Simulation of Unsteady Compressible and Incompressible Flows*
- 12:15 - 14:15 Lunch
- 14:15 - 14:35 **W. Fritz, S. Leicher** (EADS Military Aircraft, Germany) Time Accurate Numerical Simulation of Unsteady Vortical Flow Over Moving Delta Wings
- 14:35 - 14:55 **J. Forsythe, K. Squires, K. Wurtzler, P. Spalart** (USAF Academy - Boeing - Arizona State Univ. - LLC Cobalt Solutions Co.) Detached-Eddy Simulation of Massively Separated Flows Over Aircraft
- 14:55 - 15:15 **K. Squires, J. Forsythe, K. Wurtzler, P. Spalart** (USAF Academy - Boeing - Arizona State Univ. - LLC Cobalt Solutions Co.) Unsteady Aerodynamics of Maneuvering Vehicles at High Reynolds Numbers
- 15:15 - 15:35 **D. Lucor and G. Karniadakis** (Brown Univ., USA) Effects of Oblique Inflow in Vortex-Induced Vibrations
- 15:35-15:50 Closing address
Refreshments offered before departure