IUTAM Symposium on Bluff Body Flows

December 12-16, 2011

IIT Kanpur, India

PROGRAM
Day 1: Monday, 12 December 2011

09:00 – 10:30  Registration
10:30 – 10:50  Welcome
10:50 – 11:30  Opening Lecture by C.H.K. Williamson
   New phenomena in Vortex-Induced Vibrations
11:30 – 12:30  Session 1 : VIV – 1
[ Chair : C.H.K. Williamson ]
   Carmo, B., Assi, G., *Meneghini, J.
   Computational simulation of the flow-induced vibration of a circular cylinder subjected to wake interference [25]
   *Navrose, Mittal, S.
   3D computations of free vibrations of a cylinder beyond the laminar regime [64]
   *Smith, D. T., Leontini, J., Jacono, D.L., Sheridan, J.
   Vortex shedding response of streamwise driven cylinders 78]
12:30 – 14:00  Lunch
14:00 – 15:40  Session 2 : VIV - 2
[ Chair : R. Govardhan ]
Bouris, D., *Kostantinidis, E.

_Numerical study of fluid forces and vortex patterns in the wake of a circular cylinder subject to harmonic and non-harmonic inflow velocity perturbations [48]_

*Baranyi, L.

 Lowell-Reynolds number flow around a cylinder following a figure-8-path – effect of direction of orbit [14]

*Singh, S. P., Biswas, G.

_Vortex-induced vibrations of a square cylinder at subcritical Re [69]_

*Cagney, N., Balabani, S.

_Vortex Modes and Cylinder Response in Streamwise-only Vortex Induced Vibration [50]_

*Fernandes, A.C., Sefat, S. M.

_Fluttering and Autorotation of a Vertical Flat Plate about a Fixed Axis Submitted to a Uniform Horizontal Flow [54]_

**15:40 – 16:10**  
Tea

**16:10 – 17:30**  
**Session 3: Wakes – 1**

[ Chair : G. Biswas ]

*Pier, B.

_Vortex shedding patterns in the wake of a rotating sphere [76]_

*Chetan, S. J., Gaster, M.

_On the spanwise variation of vortex shedding from slender cones [42]_

*Wake characteristics of a circular cylinder attached with an oscillating splitter plate [37]*

*Ramesh, O. N.*

*Effect of steady rotation on low Reynolds number vortex shedding phenomenon [99]*

19:00 – 21:00  Reception Dinner
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>06:30 – 08:00</td>
<td>Optional walking/ biking tour</td>
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<tr>
<td>09:00 – 09:40</td>
<td>Invited Lecture by Patrick Huerre</td>
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<td></td>
<td>Instability analyses of bluff body wakes : The Karman vortex street</td>
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<td>09:40 – 10:40</td>
<td>Session 4: Stability and Transition – 1</td>
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<td>[ Chair : P. Huerre ]</td>
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<td>* Alam, M.</td>
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<td>Global Aerodynamic Instability of Two Cylinders Subjected to Cross Flow [3]</td>
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<td>Meena, J., * Mittal, S., Khan, M. H., Sidharth, G. S.</td>
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<td>Three Dimensional Instabilities in FlowPast a Spinning and Translating Cylinder [96]</td>
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<td>* Suryanarayanan, S., Brown, G.</td>
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<td>Linear and non-linear stability via Biot-Savart computations [66]</td>
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<td>10:40 – 11:10</td>
<td>Tea</td>
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<td>11:10 – 12:30</td>
<td>Session 5: Stability and Transition – 2</td>
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<td>[ Chair : B. Pier ]</td>
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<td>* Paredas, P., Theofilis, V., Rodriguez, D.</td>
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<td>On the PSE-3D instability analysis methodology for</td>
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<td>inhomogeneous shear flows [38]</td>
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*Pinto, L. C., Schettini, E. B. C., Silvestrini, J. H.

**DNS analysis of the turbulence transition wake from a mixed, forced and free oscillating rigid cylinder.** [94]

*Cadot, O., Grandemange, M., Gohlke, M., Vilaplana, G., Parezanovic, V.

**Experimental sensitivity analysis of 3D bluff body turbulent wakes using local disturbances** [23]


**Wake behind the disk - influence of disk aspect ratio** [72]

12:30 – 14:00

**Lunch**

14:00 – 14:40

**Invited Lecture** by Kerry Hourigan (with M. C. Thompson, T. Leweke, M. D. Griffith, J. Leontini, L. Schouveiler, A. Rao)

**Wake transitions of bluff bodies impacting and rolling on stationary walls.**

14:40 – 15:50

**Session 6 :Walls and free surface**

[ Chair : K. Hourigan ]

*Mirauda, D., Plantamura, A. V., Malavasi, S.

**Study of the interaction between an oscillating bluff body and a free surface flow** [70]

Quadri, R., Larrode, F. E., Negri, M., *Malavasi, S.

**Numerical modeling of the trajectory of a tethered sphere immersed in a free surface flow** [87]
*Satpathy, K., Velusamy, K., Patnaik, B. S. V, Chellapandi, P.  
Investigation of gas entrainment in a hot pool at free surface  
during cross flow over a cylindrical component [89]

*Ali, M.S., Tariq, A., Gandhi, B. K.  
(P)PIV investigation of rib turbulated flow inside a rectangular duct [103]

15:50 – 16:20  
Tea/ Group-photo

16:20 – 17:30  
Session 7: Separation bubble  
[ Chair: O. Ramesh ]

*Gajjar, J. S. B., Zahed, H. H.  
Stability of separation bubbles in a boundary layer induced by a suction slot [21]

*Behara, S., Narain, C. S. K., Mittal, S.  
Shear layer instability and laminar separation bubble on an Eppler 61 airfoil [13]

Babu.H., *Sarkar, S.  
Effect of free stream turbulence on separation bubble [84]

*Nadge, P., Govardhan, R.  
(P)Flow over a Backward Facing Step: Mean separation bubble and spanwise structure [71]

17:30 – 18:00  
Tea

18:00 – 19:15  
Cultural Program

19:30 – 21:00  
Dinner
Day 3 : Wednesday 14 December 2011

09:00 – 09:40 Invited Lecture by George Karniadakis

High Resolution Simulation of VIV

09:40 – 11:00 Session 8: Fluid-Structure Interaction – 1

[ Chair : G. Karniadakis ]

*Bourguet, R., Karniadakis, G., Triantafyllou, M.
Broadband vortex-induced vibrations of a long flexible cylinder [16]

Shukla, S., *Govardhan, R., Arakeri, J.
Flow over a bluff body with flexible splitter plates: Plate dynamics, wake velocity fields and forces [65]

Yogeswaran, V., Mittal, S., *Navrose
Vortex-induced and galloping response of a rotating circular cylinder [92]

Shirzadeh, R, *Runacres, M., Guillaume, P., Bidakhvidi, M. A.
(P) An investigation of the lock-in behavior of an oscillating cylinder in ransverse flow [8]

*Suryawansi, A., Ghosh, D.
(P) Probabilistic studies on potential flow around submerged bodies [77]

(P) Characteristics of unsteady wake for flow past synchronous transvers eoscillation of a square prism [46]
*Sridhar, M., Patnaik, B. S. V.

(P)Suppression of flow induced oscillations of a circular cylinder by an active flow control strategy [17]

11:00 – 11:30  Tea

11:30 – 12:30  Session 9: Fluid-Structure Interaction – 2

[Chair: O. Cadot]

*Bhat, S., Govardhan, R.

Stall flutter of blades at low Reynolds numbers [90]


Numerical simulation of external flows around oscillating rigid bodies using a novel fixed Cartesian grid methodology [43]

*Prasad, K., Agrawal, A., Sharma,

A. Effect of Cylinder-Spacing on Flow across three side-by-side Cylinders at Re=100 [100]

12:30 – 14:00  Lunch

14:00 – 15:10  Session 10: Multiple cylinders

[Chair: M. Alam]

Harichandan, A., *Roy, A.

Flow past two tandem circular cylinders in the vicinity of a plane wall [5]

*Gowda, B. H. L.

Flow field around four square cylinders - a flow visualization study [2]
*Sewatkar, C., Sharma, A., Agrawal, A.
Numerical and Experimental Study of Flow around Multiple In-line Square Cylinders [95]

Kumar, G. V. S., *Perumal, A., Dass, A. K.
(P) Numerical Simulation of Fluid flow of two tandem circular cylinders using Lattice Boltzmann Method [40]

*Nirmalkar, N., Chhabra, R.
(P) Interaction between two spheres falling collinearly in a viscoplastic medium [27]

*Gembarzhevskii, G., Lednev, A.
(P) Mode competition of wake behind row of two and three cylinders [106]

15:10 – 15:40 Tea

16:00 – 19:15 Session 11 : Visit to City

19:30 – 21:30 Conference Dinner
Day 4 : Thursday 15 December 2011

09:00 – 09:40 Invited Lecture by Rajat Mittal

*From Insect Flight to Heart Murmurs: Computational Modeling of Flow- Structure Interaction in Complex Biological Flows*

09:40 – 11:00 Session 12: Simulation and Modeling – 1

[ Chair : R. Mittal ]

*Shrivastava. M., Agrawal, A., Sharma, A.
A Level-Set based Immersed-Boundary Method for Moving Body Problems [101]*

*Levy, B., Liu, Y. Z.
Cactus spines and grooved cross-section, VIV reducers or self-defense mechanisms? [22]*

Mohan, M., *Desai, A., Verma, A., Mittal, S.,
Aerodynamics of Synthetic Shuttlecocks [62]*

Lakshmipathy, S., Suman, S., *Pant, R., Girimaji, S.
Application of Partially-averaged Navier-Stokes (PANS) method to simulate turbulent flow around an airship [49]

11:00 – 11:30 Tea

11:30 – 12:30 Session 13: Simulation and Modeling – 2

[ Chair : L. Baranyi ]
*Chrust, M., Bouchet, G., Dusek, J.

Domain decomposition with a spherical subdomain. A spectral azimuthal decomposition applied to a non axisymmetric geometry [4]

*Anand, V., Patnaik, B. S. V., Rao, B. N.

A novel approach for the extraction of vortex structures by using reduced order methods [44]

*Naidu, V., Young, J., Lai, J.

(P)Effect of wing flexibility on the flow structure and the performance of dragonfly hovering flight. [41]

*Canchi, T., Lai, J., Young, J.

(P)Numerical simulation of flapping wing aerodynamics using simple planform shapes [60]

*Pulipaka, R. K., *Prakash, K. A.

(P)Effect of wing cross-section on thrust of a flapping wing [63]

12:30 – 14:00  Lunch

14:00 – 15:30  Session 14: Simulation and Modeling – 3

[ Chair : J. Gajjar ]

*Sarkar, S., Mandal, R.

Control of Cavity Flow Oscillations using Pulsed Fluidic Injection [91]
*Rajani, B. N., Kandasamy, A., Majumdar, S.

LES of flow over a circular cylinder at high Reynolds number [81]

Saha, P., *Biswas, G., Sarkar, S.

Coherent structures in vortex dominated flow [104]

*Siddharth, K., Sreenivas, K. R., Ansumali, S.

(P) Three dimensional unsteady numerical simulations of flow past bluff bodies by Entropic Lattice Boltzmann method [59]

Prasath, S. G., Sudharsan, M., *Jayavel, S.

(P) Numerical Study on Influence of Blowing on Lid-Driven Cavity Flow using LCS [83]

*Santhosh, K., Chitharenjan, A., Reji, R., Lal, S. A.

(P) Flow past a re-entry vehicle at rarefied hypersonic conditions using Direct Simulation Monte Carlo Method [88]

*Chatterjee, D., Chatterjee, K., Hui, N. B.

(P) MHD flow and heat transfer around a square cylinder at low Reynolds numbers [1]

*Roy, C., Kumar, V.

(P) Computational Fluid Dynamics In GARUDA Grid Environment [6]

*Dhiman, A. K., Kasar, Y. V.

(P) Flow over an Asymmetrically Confined Circular Cylinder to Non Newtonian Power-Law Fluids [7]
Rajkumar, M. *R., Saranya, S., Venugopal, G.

(P) Numerical Analysis of Supersonic flow over wall mounted localized protrusions [75]

15:30 – 16:00
Tea

16:00 – 17:00
Session 15 : Wakes – 2

[ Chair : J. E. Wesfried ]


Identification of the kinematics of an oscillating cylinder using wake velocities [20]

*Ajithkumar, S., Sameen, A., Lal, S. A.

(P) Influence of slip on flow past cylinder at low Reynolds number [79]

*Low, H. T., Yu, P.

(P) A Numerical Study of the Steady Wake behind a Porous Bluff Body [85]

Singh, J., *Raghu, V., G., Tiwari, S.

(P) Effect of aspect ratio and trailing edge elongation of elliptical cylinder on wake characteristics [80]

*Sarkar, A., Schluter, J.

(P) Turbulent Energy Budget in the Wake of a Freely Oscillating Elastically Mounted Circular Cylinder [28]
*Sen, S., Kalita, J.

(P) Investigation on drag change of a cylinder performing rotatory oscillation [34]

*Ray, R.

(P) New findings on $\alpha$-$\beta$ Phenomena for Unsteady Flow Past an Impulsively Started Circular Cylinder [19]

*Sharma, N., Dhiman, A. K., Kumar, S.

(P) Effect of Buoyancy on the flow and heat transfer across a bluff body of square cross-section [47]


(P) Full MHD flow control over a sphere and heat transfer at low magnetic Pradtl numbers [55]

Agrawal, N., *Dutta, S., Gandhi, B.

(P) Control of flow field behind a square prism using control cylinder intermediate reynolds numbers. [82]

*Venugopal, A.

(P) Analysis of Vortex Flowmeter Signal with Empirical Mode Decomposition and Autocorrelation Function [35]

19:00 – 21:00 Dinner
Day 5 : Friday 16 December 2011

09:00 – 09:40 Invited Lecture by Jaywant H. Arakeri (with R. K. Shukla)

A unified view of energetic efficiency in active drag reduction, thrust generation and self-propulsion through a loss coefficient with application to flow past a circular cylinder with tangential surface motion

09:40 – 11:00 Session 16: Flow control – 1

[ Chair : J. Arakeri ]

Raspa, V., Gaubert, C., *Thiria, B.

On shed vortices propulsion [10]

*Raspa, V., Diana, R. G.

Direct Force Measurements of the propulsive performance of a flapping foil in a hydrodynamic tunnel [93]

*Grandemange, M., Gohlke, M., Cadot, O.

On shedding control past a simplified square back road vehicle [9]

*Guilmineau, Queutey, P., Leroyer, A., Wackers, J.

Numerical Simulation of Unsteady Flow around an Oscillating Car Model [56]

11:00 – 11:30 Tea

11:30 – 12:10 Session 17 : Flow control – 2

[ Chair : E. Guilmineau ]
*Pandya, R., Pavithran, S., Nikam, K., Singh, A.

A Turbulence based Computational Study on the Drag Breakdown of Ahmed Body [45]

*Venkataraman, D., Bottaro, A., Govindarajan, R.

Flow control via porous coating of compliant actuators: a simple interactive model [97]

12:10 – 12:30  Closing Remarks
12:30 – 14:00  Lunch

END OF SYMPOSIUM