

FSSIC2019 Symposium “Flow - Structure Sound Interactions and Control ”

26-30 August 2019, Minoa Palace Resort, Chania, Crete island, Greece

ROOM 1

The oral presentations: 20 mn, including questions. The poster presentations: 5 min

The titles of the Keynote and the Chairpersons will be provided in the final version

Monday 26 August 2019:

17:00-18:50 *Early registration*

19:00-21:00 *Cocktail and buffet at the beach in front of the Minoa resort*

Tuesday 27 August 2019:

8:30 - 9:30 *Registration and welcome coffee & refreshments*

9:30 - 9:40 *Welcome address*

Session 1 : Flow-Induced Vibrations

9:40 - 10:30 *Parviz Moin, Stanford University, USA*

Opening Lecture

Title : Progress and challenges in numerical simulation of transition and turbulence in aerospace applications

10:30-11:30: **Chairperson:** Marianna Braza

Tapered-cantilever based fluid-structure interaction modelling of the human soft-palate. J. Cisonni, A. D. Lucey and N. S. J. Elliott

Solid-fluid interaction in path instabilities of sedimenting flat objects. J. Dusek , W. Zhou and M. Chrust

Influence of gap width on fluid-structure interaction for a cylinder cluster in axial flow. P. Wang, C.W. Wong, W. Xu, Y. Zhou

11:30-12:00 *Coffee break*

12:00 - 13:00: : **Chairperson:** Yannick Hoarau

Study on wake-induced vibration for pendulum motion acting on the tandem cylinder using CFD. Cheol-Min. Lee, Kwang-Jun. Paik and Inwon. Lee

Sinuous and varicose modes in turbulent flow through a compliant channel. K. Tsigklifis and A.D. Lucey

13:00 - 14:10 *Lunch*

Session 2.I : **Oscillating/vibrating flows**

14:10 - 15:00 **Julian Hunt**, Univ. Cambridge & UCL, UK

Keynote Lecture in room 1

Title: Turbulent interfaces interacting with deformable and vibrating solid structures

15:00 -16:20: **Chairperson:** Parviz Moin

Added mass of cylinder of different shapes. Guanhao Chen, Md. Mahbub Alam and Yu Zhou

Vortex-induced vibration of a circular cylinder at high Reynolds number. Tulsi Ram Sahu, Gaurav Chopra and Sanjay Mittal

Vortex induced vibrations with bi-stable springs. R. Badhurshah, R.Bhardwaj And A. Bhattacharya

Effect of mass ratio on inline vortex induced vibrations at a low Reynolds number. D. Dorogi , L. Baranyi and E. Konstantinidis

16:20 - 16:50 *Coffee break*

Session 2.II : **Oscillating/vibrating flows**

16:50 – 17:30 : **Chairperson:** Yannick Hoarau

Damped oscillations of spherical and cylindrical pendulums. H. Stapountzis , I. Lichouna , V. Koumoukeli and M. Stapountzi

Numerical investigation of interaction between fluid and cylinder arrays with small spacing. N. Hosseini, M. D. Griffith and J. S. Leontini

19:00 *Departure for the boat trip, cocktail with finger food in the boat*

Wednesday 28 August 2019:

Session 3.I Fluid-structure interaction arising in aerodynamics

9:00 - 9:40 Petros Koumoutsakos, ETH, Zürich.

Plenary Lecture

Title : Machine Learning for Flow Sensing and Control

9:40 - 10:40: **Chairperson:** Yu Zhou

Impulsive Start-Up of a Deformable Flapping Wing at Different Angular Conditions. Daniel Diaz , Thierry Jardin, Nicolas Gourdain, Frédéric Pons and Laurent David

High-Fidelity Numerical simulation of morphing and the suppression of the 3D instabilities. N. Simiriotis, A. Marouf, G. Jodin, Y. Hoarau, J.C.R. Hunt, J.F. Rouchon and M. Braza

Predictive numerical study of cambered morphing A320 high-lift configuration based on Electro-Mechanical Actuators. A. Marouf, N. Simiriotis, Y. Bmegaptche Tekap, J.-B. Tô, J.-F. Rouchon, Y. Hoarau and M. Braza

10:40 - 11:10 *Coffee break*

Session 3.II Fluid-structure interaction arising in aerodynamics

11:10 - 12:00 Prof. Robert Antonia , University of Newcastle, Australia

Keynote Lecture in room 1

Title: "Is small scale turbulence really anomalous ?"

12:00 - 13:00: **Chairperson:** Jean-Paul Bonnet

Manipulation of a shock-wave/boundary-layer interaction in the transonic regime around a supercritical morphing wing. J.-B. Tô, N. Bhardwaj, N. Simiriotis, A. Marouf, Y. Hoarau, J.C.R. Hunt and M. Braza

Analysis of wing-tip vortex of a bird-like Morphing wing using numerical and experimental approaches. Zhe Hui , Yang Zhang and Gang Chen

Flow-induced vibration characteristics of a fix-supported elastic wing. S. Peng, S. L. Tang & Y. Zhou

13:00 - 14:10 *Lunch*

Session 3.III Fluid-structure interaction arising in aerodynamics

14:10 - 14:50 Christophe Bailly, Ecole Centrale de Lyon, France

Plenary Lecture

Title : The acoustic and turbulent nature of wall pressure fluctuations

14:50 - 16:10: **Chairperson:** Wolfgang Schröder

Dynamics of morphing cambered A320 wing by means of time-resolved PIV thanks to electroactive actuators. M. Carvalho, C. Raibaud, S.Cazin, M. Marchal, G. Harran, C. Nadal, J.F. Rouchon and M. Braza

Design and structural analysis of an A320 large-scale morphing flap based on electro-mechanical actuators and aerodynamic measurements. Y. Bmegaptche Tekap, A. Giraud , A. Marouf, C. Nadal , G. Harran , J-F. Rouchon and M. Braza

Shape control of flexible structures for morphing applications. G.K. Tairidis, A. D. Muradova and Georgios E. Stavroulakis

Camber setting of a morphing wing with macro-actuator feedback control. A. Giraud, C. Raibaud, M. Cronel, P. Mouyon, I. Ramos and C. Döll

16:10 – 16:40 *Coffee break*

Session 4 Flow physics in aeronautics

16:40 – 17:10 Spiros Pantelakis University of Patras, Greece and EASN - European Aeronautics Science Network

Invited Technology Lecture

Title : EASN: Achievements and Challenges on boosting Aeronautics and Space Academia upstream research

17:10-18:35: **Chairperson:** Alvaro Jara-Rodelgo

CFD Simulations on Morphing Wings and Aircraft in the frame of the H2020 SMS European Project. J.B. Vos , D. Charbonnier , A. Jungo, A. Marouf , N. Simiriotis , Y. Hoarau, M. Braza

A Static Aeroelastic Analysis of an Active Winglet Concept for Aircraft Performances improvement. Martin Delavenne, Bernard Barriety, Fabio Vetrano, Valérie Ferrand and Michel Salaun

Analysis of turbulent entrainment in separating/reattaching flows. N. Mazellier, F. Stella and A. Kourta

A new flutter prediction method based on reduced-order aerodynamic model. Z. Lyu, W.W. Zhang and Q.Q Diwu

Poster presentation : 5 min

Structure generated turbulence: laminar flow through metal form replica. Chanhee Moon and Kyung Chun Kim

19:30: *Departure by bus to “Nyxterida” (=”Bat” in english) restaurant - gala dinner*

Thursday 29 August 2019

Session 5 **Turbulent jets and their control**

9:00 - 9:40 Yu Zhou, Harbin Institute of Technology, Schenzhen, China

Plenary Lecture

Title : Artificial intelligence control of turbulence

9:40-10:40: **Chairperson:** Wolfgang Rodi

Frequency and duty-cycle effect of unsteady mini-jet on jet control. Perumal A. K and Yu Zhou

Large-Eddy Simulation on Jet Mixing Enhancement Using Unsteady Minijets. Yan-Yan Feng, De-Wei Fan, Bernd R. Noack, Hong Hu and Yu Zhou

Mixing characteristics of a flapping jet of self-excitation due to a flexible film. M. Wu, M. Xu and J. Mi

10:40-11:10 *Coffee break*

11:10 - 11:50 Alvaro Jara-Rodelgo, Innovation Dept of Airbus Spain

Plenary Lecture

Title : Increase of rudder efficiency by smart vortex generators: the power of foldable structures in aerodynamics

Session 6.I **Acoustics - Noise generation**

11:50-12:50: **Chairperson:** Marianna Braza

Aerodynamic sound identification of longitudinal vortex system. S, Ogawa.

Vortex and noise of airfoil near stall. P. Chen, W. J. Li, K. Zhao, R. X. Ma, X. Y. Lu and B. Zeng

Impact of optimized trailing edge shapes on noise generation. F. Kramer, M. Fuchs, T. Knacke, C. Mockett, E. Özkaya, N. Gauger and F. Thiele

12:50-14:00 *Lunch*

14:00-14:40 Koji Fukagata, Keio University, Japan

Plenary Lecture

Title : Turbulent Friction Drag Reduction: From Feedback to Predetermined and Feedback Again

Session 6.II Acoustics & Control

14:40 - 15:40: **Chairperson:** Motoaki Kimura

Aerodynamic and aero-acoustics performance of compound kinematics applied to a rotor operating at low-Reynolds number. N. Gourdain, A. Alguacil, T. Jardin

Triple-input/single-output extremum-seeking control system for jet mixing optimization. Dewei Fan, Yu Zhou and Bernd R. Noack

The POD analysis of screech tone in low mach number axisymmetric supersonic jet. Hu Li, Yong Luo and Shuhai Zhang

15:40-16:20 Xiaofeng Sun, University of Beihang, China

Plenary Lecture

Title : Some progress in the acoustic design of aircraft engine

16:20-16:50 *Coffee break*

16:50 - 17:15: **Chairperson:** Motoaki Kimura

16:50-17:15 : Poster presentations : 5 mn each

Effect of inducer sweepback on cavitation performance of centrifugal pump. Xiaorui Cheng

The investigation of water hammer with liquid-column separation transients based on two-fluid model in pipelines. You Fu , Xiaohui Wang, Shencun Miao, Zhoujian An

Aerodynamic Performance of a Sedan under WindBridge-Tunnel Road Condition. Qianwen Zhang, Chuqi Su, Yiping Wang

Skin-friction drag reduction using micro-grate patterned superhydrophobic surface. Zhang Bingfu, Tang Hui and To Sandy

Rest of the afternoon free

17:35-19:30 *Meeting of the FSSIC2019 Committee Members and selection of Best poster's award*

Friday 30 August 2019:

Session 6 Flow Control & Acoustics - I

9:00-9:40 Wolfgang Schröder, RWTH Aachen University, Germany

Plenary Lecture

Title : Unstructured Flow and Acoustics Analysis.

9:40 - 11:00 **Chairperson:** Christophe Bailly

Analysis of airfoil-shaped silencer: trade-off between aerodynamic and acoustic performance.

Keming Wu, Xingshi Jia, Hongjun Zhang and Lixi Huang

Transient loads control on a NACA 0015 airfoil A. Carusone, C. Sicot, J-P. Bonnet and J. Borée

A new passive control approach for transonic buffet flow. C.Q. Gao and W.W. Zhang

Experimental study of a passive control of airfoil lift using bioinspired feather flap. Longjun Wang ,
Md. Mahbub Alam, Yu Zhou

11:00 - 11:30 *Coffee break*

11:30-12:50: **Chairperson:** Azeddine Kourta

Vortex-induced vibration control using global linear stability and sensitivity analyses. Daiane Iglesia
Dolci1 and Bruno Souza Carmo

Measure of a drag sensitivity applied to bluff bodies with free oscillation using the adjoint method.
Daiane Iglesia Dolci and Bruno Souza Carmo

Continuous adjoint for aerodynamic-aeroacoustic optimization based on the Ffowcs Williams and
Hawkings analogy. M. Monfaredi, X.S. Trompoukis, K.T. Tsiakas and K.C. Giannakoglou

Adaptive control of transonic buffet flow. Kai Ren, Chuanqiang Gao, Weiwei Zhang

12:50 - 13:30: *Closing address and round table discussion*

13:30 - 14:40: *Lunch*

End of the 5th FSSIC2019

Note : On 31th August: 8:30 a.m. : guided day- excursion in the archaeological site of Knossos and
visit of Rethymnon port at the end of afternoon in the way back. Extra registration will be available
in the symposium site.

15:15 - 19:00 : SMS H2020 European project first day's meeting restricted to the project's partners.