PRELIMINARY PROGRAMME

More information & registration on
www.3af-aerodynamics.com

3AF
Association Aéronautique
et Astronautique de France

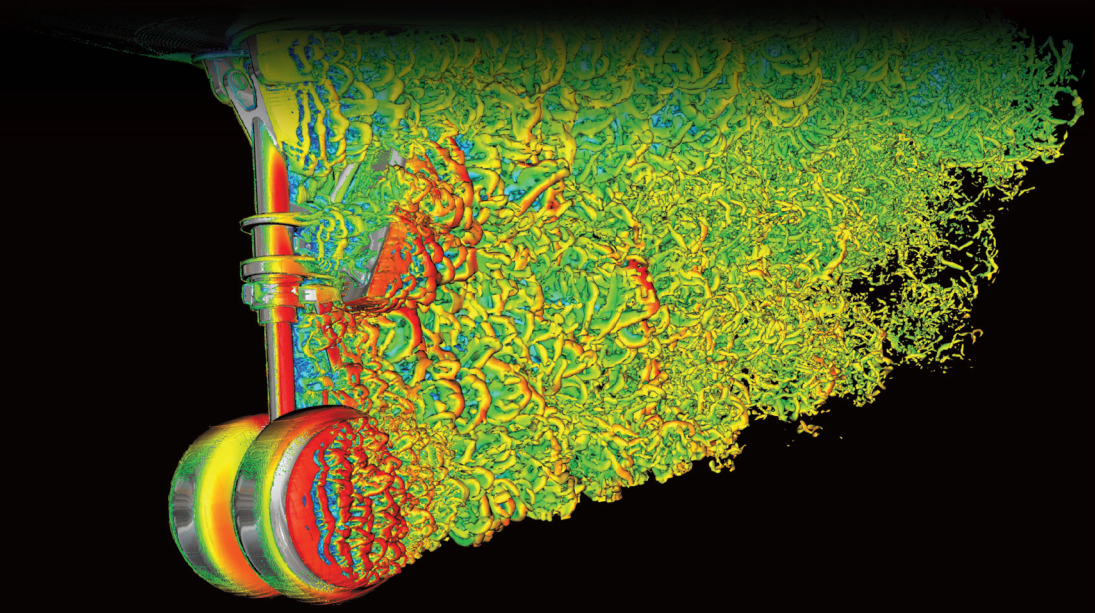
59th 3AF International Conference on Applied Aerodynamics

Unsteady Flows

Recent developments and applications

Strasbourg, France – March 24-25-26, 2025

www.3af-aerodynamics.com



WMLES of a landing gear using Immersed Boundary Condition - Credit ONERA

Université de Strasbourg · ICUBE · La Région Grand Est · CEAS Council of European Aerospace Societies · AIAA Shaping the Future of Aerospace · Royal Aeronautical Society

PRELIMINARY PROGRAMME

MONDAY, MARCH 24

08:00	**REGISTRATION**
08:45	**CONFERENCE WELCOME** **Madame Irène WEISS - Regional Advisor, Région Grand Est** **Bruno BERTHET - President, 3AF & Yannick HOARAU - iCUBE Laboratory**
	Tribute to Laurent JACQUIN - Denis SIPP (*ONERA*)
09:20	**KEYNOTE CONFERENCE N°1** **Challenges in rotary wing unsteady aerodynamics** **Dr. Arnaud LE PAPE** *(ONERA)*
10:05	***INTERSESSIONS***

	SESSION 1A **Rotorcraft** **Chairperson: Damien DESVIGNE** ***(Airbus Helicopters)***	**SESSION 1B** **Measurement Techniques** **Chairperson: Benjamin LECLAIRE** ***(ONERA)***	**SESSION 1C** **Morphing wings** **Chairperson: Yannick HOARAU** ***(Université de Strasbourg)***
10:10	**03** Assessment of a nonlinear unsteady vortex lattice-vortex particle method for predicting helicopter rotor aerodynamics **J. FU** *(Polytechnique Montreal)*	**09** A Two-Dimensional Calorimetric Wall Shear-Stress Microsensor for Unsteady Low-Speed Flows **J. WEISS** *(Technische Universität Berlin)*	**63** Electroactive morphing through spanwise travelling waves applied on an A320 wing **C. ROUAIX** *(IMFT)*
10:35	**11** Passive flow separation control in a vaned radial diffuser **A. BOULAY** *(Ecole Centrale de Lyon)*	**31** Enhancing the Effective Temporal Resolution of Schlieren Imaging for Unsteady Compressible Flows **K. SABNIS** *(Queen Mary University of London)*	**42** Drooped Leading-Edge Aerofoil for Improved Aerodynamic and Aeroacoustic Performance **F. MADI** *(University of the West of England)*
11:00	**48** Numerical modeling of propeller for a small aerial vehicle **M. LIPIAN** *(Lodz University of Technology)*	**13** Stall cell characterization over a NACA 0015 airfoil using 3D particle tracking velocimetry **S. KHALEGHIZADEH** *(Delft University of Technology)*	**64** Aerodynamic performance increase in transonic flow over an A320 morphing wing by numerical simulation at Reynolds number of 4.5 million **J. ABOU KHALIL** *(IMFT)*
11:25	**07** An exploratory study of the turbulent air flow over an island cliff face and its impact on a hovering rescue helicopter **N. WATSON** *(University of Liverpool)*	**38** Cluster-based tracking method for the identification and characterisation of vortices **C. IBÁÑEZ GARCÍA** *(Cranfield University)*	**66** Experimental study of the electroactive morphing effects on an A320 prototype in subsonic regime at Reynolds number of 1 million **J. ABOU KHALIL** *(LAPLACE)*
11:50			**67** Unsteady turbulent aerodynamic flow predictionsaround morphing wings at Reynolds number of 1 Million with Proper Orthogonal Decomposition and Machine Learning **A. MAROUF** *(Université de Strasbourg)*
12:15	**LUNCH**		

PRELIMINARY PROGRAMME

MONDAY, MARCH 24

13:30	**KEYNOTE CONFERENCE N°2** **RANS-based global stability analysis for modeling unsteady flows near onset** **Dr. Jeffrey CROUCH** *(Boeing)*
14:15	***INTERSESSIONS***

	SESSION 2A **Propulsion Systems** **Chairperson: Patrick GONIDEC** ***(Safran)***	**SESSION 2B** **Laminar Separation Bubble & Transition** **Chairperson: Maxime FORTE** ***(ONERA)***	**SESSION 2C** **Advanced Flow Field Analysis** **Chairperson: Jean-Pierre ROSENBLUM** ***(Dassault Aviation)***
14:20	**01** Performances and Flow Characteristics Comparison between Mixed-flow and its Radial-inflow Counterpart Turbines **M. BORDJANE** *(University Mohamed Boudiaf)*	**06** Dynamics and losses of a short laminar separation bubble **P. DUQUESNE** *(Ecole Centrale de Lyon)*	**45** Breakdown of exergy dissipation within regions of shockwave/viscous wake interaction **I. PETROPOULOS** *(ONERA)*
14:45	**05** Three-Dimensional Numerical Flowfields of Rotating Detonation Engines and Computational Challenges **J.C. SILVA** *(Universidade da Beira Interior)*	**08** Impact of Free-Stream Turbulence on the Laminar Separation Bubble around a DU89-134 airfoil by coupling Synthetic Eddy and Variational MultiScale Methods **C. BRUNELLI** *(Royal Military Academy)*	**36** Study of the rotational effect on the separated flow over wind-turbine-blade section based on DES **D.S. SOUZA** *(São Paulo State University)*
15:10	**21** Unsteady flow interactions and ground plane proximity in a coupled compact intake-fan in crosswind **L. LOBUONO** *(Cranfield University)*	**62** NACA0012 airfoil under varying freestream velocity at low Reynolds number **T. JARDIN** *(ISAE-SUPAERO)*	**69** Overview, scope and goals of the Multidisciplinary DPW-8 and AePW-4 Workshops **F. SARTOR** *(ONERA)*
15:35	**COFFEE BREAK**		
16:05	**22** Characterizing Unique Bi-Stability Pattern in Mach 5 Inlet Buzz Phenomena **T. GURBUZ** *(University of Manchester)*	**49** Experimental Investigation of Boundary Layer development and Transition indu-ced by large leading edge roughness in Realistic Ice Accretion Scenarios **M. PICCIOLO** *(ONERA)*	**32** Implementation and Validation of a Geometric Advection Scheme in a CLSVOF Solver **T. MRAZEK** *(Technical University of Munich)*
16:30	**30** Propeller-induced unsteady flow inside a model cooling duct of a hydrogen-electric aircraft **T. BRYCE-SMITH** *(Imperial College)*		**20** Effect of Synthetic Jet Slot Geometry on the Development and Meandering of a Wing-Tip Vortex **M. DGHIM** *(Université de Sherbrooke)*
16:55	**25** Characterisation of aerospike rocket engine using PSP measurements and CFD simulations **B. MASSE** *(Institut Saint-Louis)*		
17:20	**END OF SESSIONS**		

PRELIMINARY PROGRAMME

TUESDAY, MARCH 25

09:15	**KEYNOTE CONFERENCE N°3** **Recirculating Flow Asymmetry and Dynamics in Vehicle Wakes** **Prof. Olivier CADOT (*Liverpool University*)**

	SESSION 3A **Automotive** **Chairperson: Jacques BOREE** ***(ISAE ENSMA)***	**SESSION 3B** **Gust and buffet loads** **Chairperson: Holger BABINSKY** ***(University of Cambridge)***
10:00	**14** Coupling of bi-stable modes for squareback geometries in close-proximity **J. UPTON** *(Loughborough University)*	**46** Unsteady drag calculations during wing-gust encounter **I. ANDREU ANGULO** *(Universidad Carlos III de Madrid)*
10:25	**15** Investigating the Link Between Front and Rear Wheel Wakes of a Simplified Automotive Body **C. WALLACE** *(Loughborough University)*	**51** Unsteady Aerodynamics of Wing-Vortex Gust Encounters **P. VADHER** *(University of Cambridge)*
10:50	**18** Aerodynamics of the square-back Ahmed body under unsteady conditions **N. MAZELLIER** *(Université d'Orléans)*	**23** Transverse Gust Mitigation by Deploying Trailing Edge Flap **S. LI** *(University of Cambridge)*
11:15	**COFFEE BREAK**	
11:45	**54** Structure of the pressure fluctuations in the flow over a forward-facing step **B. PODVIN** *(Université Paris-Saclay)*	**04** Experimental and Numerical Investigation of Fast Control Surface Deflections **R. SEIDLER** *(DLR)*
12:10	**58** Assessment of turbulence models using automatic grid refinement for the Windsor body at yaw **E. GUILMINEAU** *(Centrale Nantes)*	**44** Influence of Turbulence Model and Mesh Refinement on Aerofoil Shock Buffet Onset **D. NASH** *(University of Liverpool)*
12:35	**60** Inhomogeneous turbulence effects on the aerodynamic sensitivity of an Ahmed body **J. TARAMASCO** *(University of Liverpool)*	
13:00	**LUNCH**	

PRELIMINARY PROGRAMME

TUESDAY, MARCH 25

14:15	**KEYNOTE CONFERENCE N°4** **A viewpoint on aircraft noise, aeroacoustics and simplified noise-source modelling** **Dr. Jérôme HUBER** *(Airbus)*

	SESSION 4A **Aeroacoustics** **Chairperson: Denis GELY** ***(ONERA)***	**SESSION 4B** **High Speed Flows** **Chairperson: Friedrich LEOPOLD** ***(Institute of Saint-Louis)***
15:00	**10** Isolation of Upstream Moving Acoustic Waves in Screeching Supersonic Jet **S. AHIRE** *(Indian Institute of Technology Bombay)*	**12** Aerodynamic optimization of a spin stabilized projectile under stability constraints **S. BAGY** *(Institute of Saint-Louis)*
15:25	**40** Passive Control of Aeroacoustic Noise Generation in Transonic Cavity Flow via Cylindrical Rod **M. YILMAZ** *(Turkish Aerospace)*	**19** Measuring the Influence of Ablation on Hypersonic Plasma Trails in ISL's Hyperballistic Tunnel by means of Radar: Simulation and Experiment **K. PSARRAS** *(Fraunhofer Institute for High Frequency Physics and Radar Techniques)*
15:50	**16** High-fidelity simulations of the flow around a shrouded tail rotor in hover conditions **M. SANJOSÉ** *(Ecole de Technologie Supérieure)*	**57** Tests and CFD simulations of the impact of water injection on the blast wave generated by rocket engine **J. COLLINET** *(ArianeGroup)*
16:15	**COFFEE BREAK**	
16:45	**43** Aeroacoutic study of the LAGOON landing gear using a lattice-Boltzmann flow solver and source identification techniques **D. MARTINS** *(Dasssault Systems Deutschland)*	**65** Influence of the Angle of Attack on Spiked Cylinder Flow **D. KLATT** *(Institute of Saint-Louis)*
17:10	**47** Investigating the Joined Wing Aircraft Aerocoustics Using Unsteady Flow Simulations **P. HANMAN** *(University of the West of England)*	
17:35	**END OF SESSIONS**	
19:00	**BANQUET & AWARD CEREMONY**	

PRELIMINARY PROGRAMME

WEDNESDAY, MARCH 26

09:15	**KEYNOTE CONFERENCE N°5** **Fast unsteady aerodynamic and flutter calculations for subsonic and transonic aircraft** **Prof. Grigorios DIMITRIADIS** *(Liège University)*

	SESSION 5A **Fluid-Structure Coupling** **Chairperson: Vincent BRION** ***(ONERA)***	**SESSION 5B** **Unsteady Flow Modelling** **Chairperson: Pascal LARRIEU** **(*Airbus*)**
10:00	**50** Control of Aerodynamic Loads using Unsteady Active Aerodynamic Bleed **M. DESALVO** *(Georgia Institute of Technology)*	**59** Review of Unsteady Simulations on Civil Aircraft **F. SARTOR** *(ONERA)*
10:25	**33** Large Eddy Simulations of a NACA 63(3)418 Aerofoil Undergoing One-shot Starting Cycles at Highly Unsteady Conditions **Q. MARTINEZ** *(City, University of London)*	**34** Linearly Implicit Rosenbrock Methods for Unsteady Flow Simulation **J. LÖWE** *(DLR)*
10:50	**35** Two-dimensional CFD simulation of pitching airfoil under non-harmonic motion **D.S. SOUZA** *(São Paulo State University)*	**68** Unsteady simulations of an aircraft in take-off conditions with installed engine and rotating fan **F. SARTOR** *(ONERA)*
11:15	**COFFEE BREAK**	
11:45	**28** Experimental Characterization of the Transonic Buffet Lock-In Phenomenon for an Airfoil in Free Pitching and Plunging Motion **L. SICARD** *(ONERA)*	**37** Towards Scale Resolving Simulations with CHAMPS solver **B. ARNOULD** *(Polytechnique Montréal)*
12:10	**41** Stability analysis of a two-degree-of-freedom bluff body pendulum **A. MYSKIW** *(Institut Pprime)*	**17** Investigation of corner flow separation on a 3D curved duct using non-linear closures and hybrid RANS/LES simulation **L. PRUDENZANO** *(ONERA)*
12:35	**26** CFD database for the Common Research Model (CRM) for machine learning activities **J. PETER** *(ONERA)*	**02** Using Reduced Order Model with Stochastic Closure to Estimate and Predict Unsteady Flows **F. REGNAULT** *(Scalian DS)*
13:00	**LUNCH**	
14:00	**TECHNICAL VISIT**	
16:00	**END OF AERO2025 CONFERENCE**	