

ISUAAAT17 Technical Program

Day 1, Nov 17th

	Opening Session
8:00-08:30	Registration
8:30-9:00	Welcome: Prof Mark Cassidy, Deputy Vice Chancellor Research (University of Melbourne) Opening Comments by Conference Chair. Richard Sandberg, University of Melbourne
	Session Chair: Prof Jörg Seume. Leibniz University Hannover
09:00-10:00	Conference Opening Keynote, Prof Nicole Key Purdue university
10:00-10:30	Coffee Break
	Session 1: Acoustics I
	Session Chair: Stephane Moreau (University de Sherbrooke)
10:30-10:50	ISUAAAT17- 7 Theoretical model and experimental technique of sound radiations from elliptic-shaped aeroengine Jingjing Zhu and Xun Huang
10:50-11:10	ISUAAAT17- 11 Jet flow instability with acoustic resonance feedback in an aeroengine variable bleed valve Huang Huang, You Li, Meining Chen, Jiyong Ying, Qian Gao and Huimin Sun
11:10-11:30	ISUAAAT17- 14 Impact of Aeroacoustics on Aerodynamic Damping in a Transonic 1 1/2-Stage Axial Compressor Niklas Maroldt and Jan Goessling
11:30-11:50	ISUAAAT17- 30 Effectiveness of an acoustic liner to reduce harmonic forcing Hans Mårtensson and Mattias Billson
11:50-12:10	ISUAAAT17- 89 A parameter to indicate centrifugal impeller exit BPF noise levels Janakiraman Thiyagarajan, Carl Fredriksson, Jens Fridh and Magnus Genrup
12:10-12:30	ISUAAAT17- 133 Tip noise in a compressor cascade at two operating conditions Marlene Sanjose and Stephane Moreau
12:30-13:30	Lunch
	Session 2: Flutter I
	Session Chair: Stephane Aubert (ECL, France)
13:30-13:50	ISUAAAT17- 8 Fan Blade Flutter Under Inlet Distortion: Reviewing State-of-the-Art, Dispelling Myths and Proposing Efficient Numerical Methods Dingxi Wang, Yuxuan Zhang and Xiaohe Yang
13:50-14:10	ISUAAAT17- 10 Investigation on the role of unsteady aerodynamics in 1F flutter of wide chord transonic fan blades Bharat Lad
14:10-14:30	ISUAAAT17- 13 Development, validation and application of a modal decomposition approach for fan flutter stability Roger Zoepke-Sonntag, Sina Stapelfeldt and Alessandro Guareschi

14:30-14:50	ISUAAAT17- 51 Assessment of Low- to High-Fidelity Aerodynamic Models for Propeller Whirl Flutter: Preliminary Comparisons with Experimental Results Federico Iorio, Jean-Sébastien Schotté, Antoine Placzek, Valdo Pagès and Jean-Camille Chassaing
14:50-15:10	ISUAAAT17- 65 Labyrinth seal flutter: Development & validation of an improved control volume approach Luis Llano and Jeff Green
15:10-15:30	ISUAAAT17- 91 Aeroelastic design of a large diameter composite fan blade Nenad Glodic, Mauricio Gutierrez Salas and Marcus Lejon
15:30-16:00	Coffee Break
	Session 3: Cascades I
	Session Chair: Yoon Choi (GE Aerospace)
16:00-16:20	ISUAAAT17- 9 Direct numerical simulation of particle-laden flow in a linear compressor cascade Taiyang Wang and Yaomin Zhao
16:20-16:40	ISUAAAT17- 60 Numerical investigations of cross-flow effects on separated-transition flow in low-Reynolds-number compressor cascade Xuyang Ren, Mingyang Wang, Jiangbin Zhao, Ruoyu Chen and Xingen Lu
16:40-17:00	ISUAAAT17- 57 Experimental study on the effect of the wake topology on the mixed-out loss in a high pressure turbine cascade Ines Gohl, Martin Bitter and Dragan Kozulovic
17:00-17:20	ISUAAAT17- 88 Unsteady Flow in a Transonic Compressor Cascade with Oscillating Blades Using High-Speed Two-Wavelength Interferometry Jindřich Hála, Pavel Psota, David Šimurda, Petr Šidlof and Jan Lepicovsky
17:20-17:40	ISUAAAT17- 90 Measurement of transonic airflow in an oscillating blade cascade with variable IBPA Petr Sidlof, David Šimurda, Jan Lepicovsky, Pavel Sidlof and Martin Stepan
17:40-18:00	ISUAAAT17- 93 Unsteady Loss Assessment of a Transonic Compressor Cascade Shock Boundary Layer Interaction Till Borcharding, Christoph Bode and Richard D. Sandberg
18:00-20:00	Welcome Reception

Day 2, Nov 18th

	Session Chair: Hans Mårtensson (GKN Aerospace)
09:00-10:00	Keynote 2: Marcus Meyer, Rolls Royce Deutschland
10:00-10:30	Coffee Break
	Session 1: Flutter II
	Session Chair: Kartik Venkataram (IISc, Bangalore)
10:30-10:50	ISUAAAT17- 132 The influence of the intake length on flutter stability of a fan blade Venkata Y.T. Chennuru, Fanzhou Zhao, Roque Corral and Mehdi Vahdati
10:50-11:10	ISUAAAT17- 77 The effect of turbulence anisotropy modelling accuracy on the loss prediction of a transonic compressor stage midspan section Christoph Bode, Till Borcherding and Richard Sandberg
11:10-11:30	ISUAAAT17- 35 Effect of Unsteady Flow with Unknown Frequencies on Blade Stall Flutter Prediction Using the Harmonic Balance Method Yuxuan Zhang and Dingxi Wang
11:30-11:50	ISUAAAT17- 38 Comparison of Flutter Analysis Approaches in the Frequency Domain for the ECL5 Open Fan Christian Frey, Stéphane Aubert, Pascal Ferrand, Valdo Pagès and Renaud Daon
11:50-12:10	ISUAAAT17- 66 Aeromechanics Fan Rig Darmstadt: Characterization of the structural behaviour of a modern transonic fan blisk under flutter conditions Nicklas Kilian, Silas Mütschard, Heinz-Peter Schiffer and Bharat Lad
12:10-12:30	ISUAAAT17- 95 Aeromechanics Fan Rig Darmstadt: Characterization of the aeroelastic behaviour of a modern transonic fan blisk under flutter conditions Silas Mütschard, Nicklas Kilian, Maximilian Karl, Heinz-Peter Schiffer, Marvin Ruedel and Bharat Lad
12:30-13:30	Lunch
	Session 2: NSV I
	Session Chair: Nicole Key (Purdue University)
13:30-13:50	ISUAAAT17- 76 Global Stability Analysis for Shock Buffet in a Transonic Axial Flow Fan Kartik Venkatraman and Jyoti Ranjan Majhi
13:50-14:10	ISUAAAT17- 83 Interplay of Fluid Modes and Aerodynamic Mistuning in Transonic Fan Shock Buffet Kartik Venkatraman and Jyoti Ranjan Majhi
14:10-14:30	ISUAAAT17- 99 Non-Synchronous Vibration: Influence of blade vibration on aerodynamic disturbances Pierre Tharreau, Magnus Hardy-Falch, Sina Stapelfeldt and Christoph Brandstetter
14:30-14:50	ISUAAAT17- 16 A numerical study on non-synchronous vibration of a UHBR fan through nonlinear fluid structure interaction Huayin Chen, Kailong Xia, Hefang Deng, Mingmin Zhu and Jinfang Teng
14:50-15:10	ISUAAAT17- 12 Analysis of the onset of transonic buffet in a civil fan blade Jiayi Gong and Sina Stapelfeldt

15:10-15:30	ISUAAAT17- 42 Low-frequency limit cycles in URANS simulations of centrifugal compressors: analysis and flow characterization Arno Defaye, Pierre Duquesne and Stéphane Aubert
15:30-16:00	Coffee Break
	Session 3: Methods I
	Session Chair: Jan Heners (MTU aero engines)
16:00-16:20	ISUAAAT17- 123 Leveraging time-resolved LES data from multi-stage low-pressure turbines to quantify unsteady losses via (spectral) proper orthogonal decomposition Marco Rosenzweig, Melissa Kozul and Richard Sandberg
16:20-16:40	ISUAAAT17- 122 Machine-learning strategies to train closure models for Low-Pressure Turbines with unsteady inflow conditions Yue Gu, Yuan Fang, Harshal D. Akolekar, Andrew S. H. Ooi and Richard D. Sandberg
16:40-17:00	ISUAAAT17- 100 Influence of Stator Blades and Exhaust Hood on Flutter Prediction in the LP Last Stage of a Steam Turbine Arkadiusz Koprowski, Romuald Rządkowski and Leszek Kubitz
17:00-17:20	ISUAAAT17- 127 On the Efficacy of Riblets in Mitigating Losses Incurred Over the T106C blade due to Wake Induced Transition Sumit Sarvankar, Sai Nikhil Kotturi, Melissa Kozul, Nagabhushana Rao Vadlamani and Richard D. Sandberg
17:20-17:40	ISUAAAT17- 102 On the Formulation of the Energy Method to Compute Flutter Saturated Solutions Salvador Rodriguez, Javier Luis González Monge and Carlos Martel
17:40-18:00	ISUAAAT17- 72 Comparative evaluation for spectrum-based analysis and machine learning algorithms for axial compressor damage assessment Mario Eck, Dieter Peitsch and Jan Mihalyovics
18:30-20:30	Scientific committee dinner meeting

Day 3, Nov 19th

08:00-9:30	Travel to Healesville
9:30-10:00	Coffee Break
	Session 1: Distortion I
	Session Chair: Rao Vadlamani (IIT-Madras)
10:00-10:20	ISUAAAT17- 15 Upstream Attenuation of Intake Distortion due to engine-intake interaction - A numerical study Amelie Haber, Richard Flekstad and Dragan Kožulović
10:20-10:40	ISUAAAT17- 26 Research on Design Technology of Simulating Plates for Compressor Total Pressure Distortion Taohua Yang and Wei Yuan
10:40-11:00	ISUAAAT17- 31 Numerical Investigation of Casing Treatment Effectiveness for BLI-like Distortion at Various Skewed Angles Yuanhua Liu and Wei Yuan
11:00-11:20	ISUAAAT17- 119 Effect of Circumferential Inlet Distortion on Flutter Stability of a Transonic Fan Using an Approximate Time Domain Nonlinear Harmonic Method Hangkong Wu, Zeming Wang, Haideng Zhang, Yun Wu and Dingxi Wang
	Session 2: Mistuning I
	Session Chair: Roque Corral (Universidad Madrid)
11:20-11:40	ISUAAAT17- 58 Transient Forced Response of a Mistuned Blisk Rotor in a Multistage Axial Compressor Yujun Leng, Douglas Matthews, Jhansi Dodda and Nicole Key
11:40-12:00	ISUAAAT17- 61 Experimental Aeroelastic Analysis of a 1.5-stage Transonic Compressor with Different Structural Mistuning Patterns Marvin Rüdell, Benedikt Radermacher, Nicklas Kilian, Heinz-Peter Schiffer, Thomas Giersch and Bernd Becker
12:00-12:20	ISUAAAT17- 92 Impact of Uncertainties on Mistuned Forced Response Predictions in a Transonic Compressor Blisk Mauricio Gutierrez Salas and Nenad Glodic
12:20-12:40	ISUAAAT17- 21 Study of the effect of contact mistuning on the flutter of interlocked turbine blades using a conceptual model Juan Manuel Gallardo, Oscar Pérez Escobar, Asier Elorza and Roberto Alonso
12:40-14:00	Lunch Break
14:00-17:00	Free time in Healesville sanctuary
17:00-18:00	Welcome to country event
18:00-20:30	Bush BBQ

Day 4, Nov 20th

Session Chair: Richard Sandberg (University of Melbourne)	
09:00-10:00	Keynote 3: Tsuyoshi Minowa (Ansys Japan)
10:00-10:30	Coffee Break
Session 1: Forced Response I	
Session Chair: Kenneth Hall (Duke University)	
10:30-10:50	ISUAAAT17- 32 Numerical investigation of the importance of Tyler-Sofrin modes as a source of Low Engine Order excitation Óscar Pérez Escobar and Juan Manuel Gallardo
10:50-11:10	ISUAAAT17- 44 Numerical Study on The Influence of Tyler-Sofrin Modes on Excitation Forces in 1.5-stage Axial Compressors Tetsuya Oshio, Atsushi Tateishi and Shinya Kusuda
11:10-11:30	ISUAAAT17- 74 Influence of test conditions on the aerodynamic and aeroelastic behaviour of the ECL5/CATANA fan Anne-Lise Fiquet, Alexandra Patrizia Schneider, Benoit Paoletti, Xavier Ottavy and Christoph Brandstetter
11:30-11:50	ISUAAAT17- 107 Aerodynamic clocking associated with compressor inlet conditions and its effect on embedded rotor forced response Jhansi Reddy Dodda, Yujun Leng, Douglas Matthews and Nicole Key
11:50-12:10	ISUAAAT17- 115 Unsteady In-Plane Force Assessment of an Open Rotor at Take-Off with Angle of Attack Michele Greco and Roque Corral
12:10-12:30	ISUAAAT17- 46 Unsteady flow simulation in a three stage turbine with cavities using time- and frequency-domain methods Maximilian Hartmann, Daniel Schluß and Jan Heners
12:30-13:30	Lunch
Session 2: Heat Transfer I	
Session Chair: Xiaofeng Sun (Beihang University)	
13:30-13:50	ISUAAAT17- 24 Unsteady ingestion and jet film cooling characteristics in turbine multi-gap endwall under upstream wake influence Kaiyuan Zhang, Zhiyu Li, Zhigang Li and Jun Li
13:50-14:10	ISUAAAT17- 25 Turbine Nozzle Guide Vane Endwall Aerothermal Performance with Pulsated Flow induced by Hydrogen Combustion Bo Bai, Hao Zhang, Zhigang Li and Jun Li
14:10-14:30	ISUAAAT17- 27 A 1D-3D Coupled Approach for Air-cooled Turbine Unsteady Flow Simulation Shiji Wang, Chunxiao Xu, Qiyue Chang and Jie Zhou
14:30-14:50	ISUAAAT17- 52 Data-Driven Prediction of Unsteady Mixer Outlet Temperature in High-Altitude Engine Inlet Systems Using a Stacking Framework with an Error Compensation mode Chenchen Wang, Chunyan Hu, Wei Li, Hanling Xu, Keqiang Miao and Jiaxian Sun

14:50-15:10	ISUAAAT17- 55 Numerical investigation into the effect of non-uniform inlet pressure profiles on the hot gas ingestion of the stator-rotor cavity Zhe Jia, Zhao Liu and Zhenping Feng
15:10-15:30	ISUAAAT17- 120 Efficient Unsteady Simulations of Cooled Turbines using Harmonic Balance Michael Müller, Robin Schöffler, Clemens Grunwitz and Christian Morsbach
15:30-16:00	Coffee Break
	Session 3: Compressor Design I
	Session Chair: Dingxi Wang (Northwestern Polytechnical University, Xi'an)
16:00-16:20	ISUAAAT17- 22 Comparative study on the influence of unsteady and uniform micro tip injections on the stability of a low-speed compressor Zhuoqi Liu, Jiandong Yan, Zhaoqi Yan and Tianyu Pan
16:20-16:40	ISUAAAT17- 29 Prediction of the unsteady compressor performance by using time and frequency domain methods Jan Heners, Gabriele Zuin, Matteo Zuccaro, Maximilian Hartmann and Daniel Schluß
16:40-17:00	ISUAAAT17- 67 Dynamic analysis of non-smooth contact in bladed disk root joints via an equality-based frequency domain method Sebastian McDonald, Mathias Legrand and Christophe Pierre
17:00-17:20	ISUAAAT17- 84 Potential of strongly coupled time domain FSI simulations on the example of the ARIAS CTA LPT rotor Matthias Freimuth, Stephan Behre and Florian Herbst
17:20-17:40	ISUAAAT17- 97 Unsteady Flow Control Mechanisms of Casing Treatment Across Reynolds Numbers in Transonic Axial Fan Rotors Jiangbin Zhao, Xu Dong, Xuyang Ren, Ruoyu Chen, Shilong Yuan and Xingen Lu
18:00-20:00	Film Event (optional): Engineering Ethics vs Corporate Leadership Registration under: https://www.eventbrite.com/e/engineering-ethics-in-corporate-culture-no-highway-in-the-sky-tickets-1448317579869?aff=odcleoeventsincollection&keep_tld=1

Day 5, Nov 21st

Session 1: Compressor Design II	
Session Chair: Tetsuya Oshio (IHI Corporation)	
8:30-8:50	ISUAAAT17- 70 A Theoretical and Experimental Study on Partial Casing Treatment Yuting Huang, Xu Dong, Yuqing Wang, Jia Li, Dakun Sun and Xiaofeng Sun
8:50-9:10	ISUAAAT17- 71 Theoretical Design and Experimental Investigation of Impedance Boundary Condition Casing Treatment Jiahao Hu, Ruize Xu, Dengke Xu, Xu Dong, Dakun Sun and Xiaofeng Sun
9:10-9:30	ISUAAAT17- 78 Detection of stall characteristics in single stage compressor rigs, leveraging circumferential sensor positions in blade pitch intervals Ergin Tüzüner, Mario Eck and Dieter Peitsch
9:30-9:50	ISUAAAT17- 53 Full annulus hybrid RANS/LES prestall prediction of transonic axial compressor compared to real engine data Julian A. Scheibel, Yannik Schäfer, Marcel Stöbel and Dragan Kožulović
9:50-10:10	ISUAAAT17- 112 Optimization of an Asymmetrical Vaned Diffuser to Improve Performance and Durability of a Radial Compressor Maximilian Steffens, Max A. Bartholet, Christopher Fuhrer and Damian M. Vogt
10:10-10:30	ISUAAAT17- 69 Effect of blade loading distribution on axial compressor flow stability with increasing tip clearance Zeyu Zhou, He Zhang, Ming Zhang, Dengke Xu, Jia Li, Zhuo Wang, Lujia Liu, Dakun Sun and Xiaofeng Sun
10:30-11:00	Coffee break
Session 2: Methods II	
Session Chair: Christian Frey (DLR)	
11:00-11:20	ISUAAAT17- 111 Numerical evaluation of the impact of lip thickness on intake reflection coefficients Venkata Y.T. Chennuru, Juan Rodriguez-Díaz, Javier González-Monge and Roque Corral
11:20-11:40	ISUAAAT17- 116 Analysis of Flow Instabilities in Turbomachinery Using a Nonlinear Eigenvalue Problem Solver Kenneth Hall and Christopher Kaminiski
11:40-12:00	ISUAAAT17- 43 Study on the aerodamping of a 1.5-Stage Compressor rotor in stage environment Xuedong Zheng, Lei Jin, Baotong Wang, Chuanxiang Yan and Xinqian Zheng
12:00-12:20	ISUAAAT17- 37 Unsteady flow of a transonic turbine blade with shock control bump using DDES Weiran Zhang, Jian Chen, Xinrong Su and Xin Yuan
12:20-12:40	ISUAAAT17- 137 Reconstruction of flow fluctuations from measurements of the mean Romain Peron, May Smith, Vincent Mons, Olivier Marquet and Justin Leontini

12:40-13:00	ISUAAAT17- 82 Data-Driven Flutter Prediction for Axial Compressors Using Deep Learning Models Judith Kraus, Mario Eck and Dieter Peitsch
13:00-14:00	Lunch