

ISUAAAT16 Technical Program

Day 1

	Opening Ceremony
09:00-09:15	Conference Chair. Prof. Roque Corral. Universidad Politécnica de Madrid
	Conference Opening Keynote
	Session Chair: Robert Kielb. Duke University
09:15-10:30	Inventing the Joint Strike Fighter. Dr. Paul Bevilaqua. Ex- Lockheed Martin
10:30-11:00	Coffee Break
	Sep 19th Session 1: Forced Response I
	Session Chair: Harald. Schoenborn. MTU
11:00-11:30	ISUAAAT16- 54. Effects of Blade Count Ratio in Forced Response Analysis on Aerodynamic Forcing of a Subsonic Axial Compressor T. Oshio, M. Aotsuka, A. Tateishi and S. Kusuda. IHI Corporation
11:30-12:00	ISUAAAT16- 70. Modeling method for aeroelastic low engine order excitation originating from upstream vanes geometrical variability M. Gambitta, B. Beirow (Brandenburg University of Technology) and S. Schrape (Rolls-Royce)
12:00-12:30	ISUAAAT16- 36 Experimental Investigation of the Sensitivity of Forced Response to Cold Streaks in an Axial Turbine L. Stania, F. Ludeneit and J.R. Seume. Leibniz University Hannover
12:30-13:00	ISUAAAT16- 24 Uncertainty Quantification Study of the effect of Inlet Temperature Distortions on the LEO Forced Response of a High-Pressure Turbine Rotor using the Polynomial Chaos Expansion Method A. Trafford, S. Stapelfeldt, R. Puente-Rico (Imperial College) and D. Kulkarni (Rolls-Royce)
13:00-14:30	Lunch
	Sep 19th Session 2: Mistuning I
	Session Chair: E Petrov. University of Sussex
14:30-15:00	ISUAAAT16- 60 Identification of the Aeromechanical Parameters of a Compressor Rotor from Blade Tip Timing Data Kenneth Hall (Duke University), Steven Hall (MIT)
15:00-15:30	ISUAAAT16- 77 Mistuning identification of blisks using mass detuning and influence coefficients M. Cimpuiaru, S. Kelly, A. Lupini, (University of Michigan) C. Keener, K. D'Souza (University of Ohio) and B. Epureanu (University of Michigan)
15:30-16:00	ISUAAAT16- 19 Numerical Investigation of the Excitation Characteristics of Contaminated Nozzle Rings M. Beierl, D. Vogt, (University of Stuttgart), M. Fischer, T. Müller and K.K. So (Turbo Systems Switzerland Ltd)
16:00-16:30	Coffee Break
	Sep 19th Session 3: Methods I
	Session Chair: L He. University of Oxford
16:30-17:00	ISUAAAT16- 2 Analyzing Unsteady Turbomachinery Flow Simulations with Mixing Entropy Christian Frey, Benedict Geihe and Laura Junge. DLR
17:00-17:30	ISUAAAT16-58 Time-Inclined Method Validation in a Turbomachinery High-Order Solver R. Corral, M. Montiel (Universidad Politécnica de Madrid) and Fernando Gisbert (ITP Aero).
17:30-18:00	ISUAAAT16- 25 Root cause investigation of a non-physical time domain harmonic balance solution Sen Zhang and Dingxi Wang. Northwestern Polytechnical University

Day 2

Invited Lecture I	
Session Chair: H Martensson. GKN Aerospace	
09:00-9:30	Do old researchers have more wisdom than young ones? Prof Bob Kielb. Duke University
Sep 20th Session 1: Aerodamping Fundamentals	
Session Chair: H Martensson. GKN Aerospace	
90:30-10:00	ISUAAAT16-10 Influence of Different Gases and Mach Number Variations on the Aerodynamic Damping of an Industrial Axial Compressor L. Stuhldreier, H. Hoffmann, J. Koppelberg, R. van Rennings and P. Jeschke. RWTH Aachen University
10:00-10:30	ISUAAAT16-12 Flutter analysis of last stage steam turbine rotor blades with uniform and nonuniform pressure distribution behind rotor blades R. Rzadkowski, L. Kubitz, A. Koprowski (Polish Academy of Sciences) and L. Kolodyazhnaya (National Academy of Science of Ukraine).
10:30-11:00	Coffee Break
Sep 20th Session 2: Vibrating Cascades	
Session Chair: D Vogt, University of Stuttgart	
11:00-11:30	ISUAAAT16- 69 Experimental Investigations on Aeroelastic Stability of Combined Plunge-Pitch Mode Shapes in a Linear Compressor Cascade Julian Gambel, Dieter Peitsch (TU Berlin) and Sabine Schneider (Rolls-Royce Deutschland)
11:30-12:00	ISUAAAT16- 34 Validation of unsteady aerodynamics in a transonic linear cascade at first flex mode shape at near stall conditions C. Tavera-Guerrero, N. Glodic, M. Gutierrez-Salas (KTH) and H. Mårtensson (GKN)
12:00-12:30	ISUAAAT16- 62 Transonic Compressor Linear Cascade with an Oscillating Single Blade J. Lepicovsky, P. Sidlof, D. Simurda and M. Stepan. Czech Academy of Sciences/TU of Liberec
12:30-13:00	ISUAAAT16- 35 Aeroelastic response of a transonic compressor cascade at high reduced frequencies N. Glodic, C. Tavera-Guerrero and M. Gutierrez-Salas (KTH)
13:00-14:30	Lunch
Sep 20th Session 3: TRL 4 Tests I	
Session Chair: C Brandstetter. Ecole Centrale de Lyon	
14:30-15:00	ISUAAAT16- 30 Experimental research into aeroelastic phenomena in turbine rotor blades inside ARIAS EU project J.M Gallardo, B. Oscar (ITP Aero), J. Hernández, Gadea García (CTA), J. Gallego, D. Knappett (Rolls-Royce), V. Kharyton, M. Wurl (Siemens Energy) and R. Corral (UPM)
15:00-15:30	ISUAAAT16- 21 A new axial compressor test facility for the investigation of aerodynamic damping featuring an electromagnetic excitation system P. Buchwald, F. Müller, M. Günther and D. Vogt , (University of Stuttgart),
15:30-16:00	ISUAAAT16- 31 Aerodynamic Damping Measurement of Axial Compressor with Acoustic Excitation T. Azuma, H. Yamashita and N. Ikeuchi. Mitsubishi Heavy Industries
16:00-16:30	Coffee Break
Sep 20th Session 4: Forced Response II	
Session Chair: S Hegde, Pratt and Whitney	
16:30-17:00	ISUAAAT16- 48 Forced-Response Measurements and CFD-Analysis of Higher Vibration Modes in a 2.5-stage Axial Compressor Rig H. Schoenenborn, C. Wohlfahrt, T. Groscurin (MTU Aeroengines), T. Widera and P. Jeschke (RWTH Aachen University)

17:00-17:30	ISUAAAT16- 37 Numerical Investigation of Forced Response in a Transonic Compressor Stage – Highlighting Challenges Using Experimental Validation N. Kilian, F. Klausmann, D. Franke, Heinz-Peter Schiffer (TU Darmstadt) and M. Gutiérrez Salas (KTH)
17:30-18:00	ISUAAAT16- 56 Investigation of the impact of stagger angle mistuning on the unsteady flow in a transonic rotor at a near stall condition Dongming Cao, Dingxi Wang and Xiuquan Huang. Northwestern Polytechnical University

Day 3

Invited Lecture II	
Session Chair: Yoon Choi. General Electric	
09:00-10:00	Fan Installation Interaction in Future Propulsion Systems Prof Cesare Hall. Cambridge University
10:00-10:30	Coffee Break
Sep 21th Session 1: Fans and Wind Turbines	
Session Chair: M Vahdati. Imperial College London	
10:30-11:00	ISUAAAT16-45 Search for the origin of subsonic flutter on the UHBPR ECL5 fan at partial speed V. Pages, J.F. Monier, P. Duquesne, S. Aubert and P. Ferrand. Ecole Centrale de Lyon.
11:00-11:30	ISUAAAT16-64 UHBR open-test case fan ecl5/Catana: effect of aerodynamic disturbances on aeroelastic stability at part-speed conditions A.L. Fiquet, X. Ottavy and C. Brandstetter. Ecole Centrale de Lyon.
11:30-12:00	ISUAAAT16-40 Unsteady aerodynamic forcing due to distortion in a boundary layer ingesting fan Hans Mårtensson and Mattias Billson. GKN
12:00-12:30	ISUAAAT16-85 Numerical investigation of aeroelasticity of wind turbines using a nonlinear frequency domain solution method Mt Rahmati and Shine Win Naung. Northumbria University.
12:30-1:00	ISUAAAT16-86 Direct numerical simulations of horizontal-axis wind turbine blade section by considering aeroelastic vibrations Mahdi Erfanian Nakhchi and Mohammad Rahmati. Northumbria University.
13:00-14:30	Lunch
Sep 21th Session 2: Non-Synchronous Excitation	
Session Chair: S Stapelfeldt. Imperial College London	
14:30-15:00	ISUAAAT16- 26 Experimental investigation of non-synchronous vibration by transient and steady-state measurements V. Hernley, A. Jemcov, J. Kang, S. Morris (U. of Notre Dame) and M. Montgomery (Doosan)
15:00-15:30	ISUAAAT16- 33 High-fidelity simulations of the acoustic response of a transonic compressor stage P. Przytarski, J. Leggett, R. Sandberg (Univ. of Melbourne) and C. Bode (TU Braunschweig)
15:30-16:00	ISUAAAT16- 29 Rotating stall inception prediction using an eigenvalue-based global instability analysis method S. Xu, C. Yuan, D. Wang and D. Sun. Northwestern Polytechnical University
16:00-16:30	Coffee Break
Sep 21th Session 3: Mistuning II	
Session Chair: C Martel. Universidad Politécnica de Madrid	
16:30-17:00	ISUAAAT16- 75 Transient and steady-state forced response analysis of mistuned bladed disks with modal properties and excitation forces varying with the rotation speed Jing Tong, Chaoping Zang and Evgeny Petrov
17:00-17:30	ISUAAAT16- 38 Influence of inlet guide vane pattern on aeromechanics and aerodynamic mistuning in a transonic compressor Daniel Franke, Fabian Klausmann, Jonas Foret, Heinz-Peter Schiffer, Thomas Giersch and Bernd Becker
17:30-18:00	ISUAAAT16- 15 Intentional excitation of a radial turbine rotor by means of geometrical mistuning of the vane ring A. Zobel, D.M. Vogt, (University of Stuttgart), M. Schafferus, M. Sasakaros, M. C. Wirsum (RWTH Achen) and A. Blessing . (Kompressorenbau Bannewitz GmbH)

Day 4

Invited Lecture III	
Session Chair: Stephane Aubert. Ecole Centrale de Lyon	
09:00-10:00	Accelerating Sustainable Propulsion and Power through modelling and Simulation Dr Sunil Patil. ANSYS
10:00-10:30	Coffee Break
Sep 22nd Session 1: Seal Flutter	
Session Chair: Jeff Green. Rolls-Royce	
10:30-11:00	ISUAAAT16-51 Development of a Novel Static Seal Flutter Rig F. Hualca, C.Schwingshackl (Imperial College), J. Gallego, R.Setchfield (Rolls-Royce), D. Korte (MTU), R. Corral, M. Greco (UPM) and Oscar Bermejo (ITP)
11:00-11:30	ISUAAAT16-17 Numerical and experimental study of flutter in a realistic labyrinth seal O. Bermejo, J.M. Gallardo, A. Sotillo, A. Altuna, A. Puente and R. Alonso. ITP Aero
11:30-12:00	ISUAAAT16-22 Preliminary Investigations with Pressure Actuated Leaf Seals for Superheated Steam Turbine Application Andreas Wittenberg, Heiko Schwarz and Jens Friedrichs. TU Braunschweig
12:00-12:30	ISUAAAT16-46 Experimental validation of a seal flutter model Roque Corral and Michele Greco. Universidad Politécnic de Madrid
12:30-1:00	ISUAAAT16-87 A Proper Orthogonal Decomposition Method for Analysis of Unsteady Flows in Turbomachinery Cascades Elizabeth Krath, Forrest Carpenter and Paul Cizmas. Texas A&M
13:00-14:30	Lunch
Sep 22nd Session 2. Noise	
Session Chair: H Atassi. University of Norte Dame	
14:30-15:00	ISUAAAT16- 7 Noise testing and prediction of a 3-stage high-speed turbine for ultrafan® A. Serrano-González, J.R. Fernández-Aparicio (ITP) and J. Hernández (CTA)
15:00-15:30	ISUAAAT16- 55 Acoustic impedance education of MDOF liners with numerical and analytical approaches under grazing flow conditions S. Giaccherini, L. Pinelli, M. Marconcini, R. Pacciani and A. Arnone. Univ. of Florence
15:30-16:00	ISUAAAT16- 57 Improvement of the triple-plane pressure mode matching technique and its application to harmonic balance simulations Sébastien Guérin. DLR
16:00-16:30	Coffee Break
Sep 22nd Session 3: Methods II	
Session Chair: D Wang. Northwestern Polytechnic University	
16:30-17:00	ISUAAAT16- 4 Simulation of Indexing and Clocking with a New Multidimensional Time Harmonic Balance Approach Laura Junge, Christian Frey, Graham Ashcroft and Edmund Kuegeler. DLR.
17:00-17:30	ISUAAAT16- 44 Coupled Simulation of a Shrouded Turbine Blade Row with Contact Friction Interfaces - Analysis of a Limit Torus Oscillation Christian Berthold and Christian Frey. DLR.
17:30-18:00	ISUAAAT16- 43 Bringing turbomachinery aeromechanics research closer to education N. Glodic, M. Gutierrez-Salas (KTH), Daniel Franke (TU Darmstadt), C. Tavera-Guerrero (KTH) and Fabian Klausmann (TU Darmstadt)

Day 5

Sep 23rd Session 1 Methods III	
Session Chair: K Hall, Duke University	
9:00-9:30	ISUAAAT16- 53 Turbomachinery aerodynamic and aeroelastic predictions with machine learning Mehdi Vahdati, Xiao He, Quentin Rendu, Marco Rauseo, Loic Salles and Fanzhou Zhao. Imperial College
9:30-10:00	ISUAAAT16-72 A log-w Turbulence Model Formulation for Flutter Analysis with Harmonic Balance Michael Müller, Hans-Peter Kersken and Christian Frey. DLR
10:00-10:30	ISUAAAT16- 89 Block Spectral Method Analysis for Turbomachinery Applications R. Corral and D. Romera. Universidad Politécnica de Madrid
10:30-11:00	Coffee Break
Sep 23rd Session 2 TRL 4 Tests 2	
Session Chair: T Fransson. KTH	
11:00-11:30	ISUAAAT16- 52 Validation of Unsteady Surface Pressure Predictions for MT-1 Rig Turbine Blades Davendu Kulkarni (Rolls-Royce) and Kam Chana (University of Oxford)
11:30-12:00	ISUAAAT16- 9 Experimental Investigation of Rotor-Stator Interactions across all Axial Gaps of a 2.5-Stage Axial Compressor for improved Forced Response Prediction F. Linke (RWTH Aachen University), H. Schoenenborn (MTU) and P. Jeschke (RWTH Aachen University)
12:00-12:30	ISUAAAT16- 65 Experimental investigation of acoustic modes of a depth variable Helmholtz resonator for low to high subsonic flow speeds Steffen Hammer, Jens Fridh (KTH) and Mattias Billson (GKN)
12:30-13:00	Closing Ceremony
13:00-14:30	Lunch