

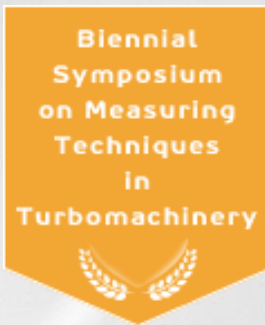


XXIII Biennial Symposium on Measuring Techniques in Turbomachinery

Stuttgart, 1-2 September 2016

PROGRAM





XXIII Biennial Symposium on Measuring Techniques in Turbomachinery

Stuttgart, 1-2 September 2016

Thursday 1 September 2016

08:00 – 08:50 Registration

08:50 – 09:00 Welcome to XIII SMTT

Session A1 Measurement of turbomachinery flows

Chair: Damian Vogt

09:00 *Measurement of unsteady aerodynamic data in turbomachinery periodic flows*

J. Lepičovský and D. Šimurda

Institute of Thermomechanics AS CR, Prague Czech Republic

09:25 *Advances in heat transfer and unsteady flow measurements in a smooth stator rotor cavity with purge flow, with variable axial gap*

H. Koivisto and M. Rose

Thermo-Fluid Mechanics Research Center, University of Sussex, United Kingdom

09:50 *Experimental investigation of the effects of different installment positions of airfoil-probes on the flow field of a compressor cascade*

H. Ma and C. Jin

School of Energy and Power Engineering, Beihang University, China

10:15 *A miniature optical extinction heated probe for fog droplet measurements in steam turbines*

I. Bosdas, M. Mansour, A. Kalfas and R. Abhari

Laboratory for Energy Conversion, ETH Zurich, Switzerland

10:40-11:00 Coffee break

Session A2 Temperature probes and thermocouples

Chair: Jens von Wolfersdorf

- 11:00** *A fast response total temperature probe for turbomachinery*
M. Arenz, S. Staudacher, B. Lüttig, W. Berns and M. Rose
Institute of Aircraft Propulsion Systems (ILA), University of Stuttgart, Germany
- 11:25** *Measurement of thermal wakes in compressor secondary air systems using low frequency thermocouple data*
M. Puttock and M. Rose
Thermo-Fluid Mechanics Research Center, University of Sussex, United Kingdom
- 11:50** *Unsteady temperature measurements through digital compensation of dual wire thermocouples*
J. Braun and G. Paniagua
School of Mechanical Engineering, Purdue University, Indiana, United States
- 12:15** *Highly reliable aerodynamic calibration for ground and flight testing total temperature probes*
F. Fontaneto and A. Lahalle
von Karman Institute for Fluid Dynamics, Rhode-St-Genèse, Belgium

12:40-14:00 Lunch at IBZ

Session A3 Novel instrumentation and hot-wire anemometry

Chair: Guillermo Paniagua

- 14:00** *Wireless RF telemetry for rotating frame data acquisition and control*
J. Farman
Whittle laboratory, Cambridge University, United Kingdom
- 14:25** *Measurement of tip clearances using capacitive proximity sensors in turbine rotor stator cavities*
D. Payne and V. Kanjirakkad
Thermo-Fluid Mechanics Research Center, University of Sussex, United Kingdom
- 14:50** *Multi-hotwire probe sensitivity optimization in constant temperature anemometry (CTA) for transonic flows*
E. Yablochkin and B. Cukurel
Technion-Israel Institute of Technology, Haifa, Israel
- 15:15** *Towards a more reliable application of hot-wire anemometry in complex compressible flows*
E. Boufidi and F. Fontaneto
von Karman Institute for Fluid Dynamics, Rhode-St-Genèse, Belgium

15:40-16:00 Coffee break

Session A4 Heat transfer measurements

Chair: Beni Cukurel

16:00 *A comparison between transient heat transfer measurements using TLC and IR thermography*

S. Brack and J. von Wolfersdorf

Institute of Aerospace Thermodynamics (ITLR), University of Stuttgart, Germany

16:25 *Heat thin film gauge arrangements for transient heat transfer measurements*

I. Usandizaga, P. Beard, K. Chana and T. Povey

Osney Thermofluids Laboratory, Oxford University, United Kingdom

16:50 *Discrete functions approach to retrieve heat flux*

D. Cuadrado and G. Paniagua

School of Mechanical Engineering, Purdue University, Indiana, United States

17:15 **Laboratory Tours**

19:30 **Departure for Dinner**

Friday 2 September 2016

Session B1 Pressure probes I

Chair: Jan Lepičovský

09:00 *Analysis and optimization of a high-frequency aerodynamic probe*

Z. Liu and G. Paniagua

School of Mechanical Engineering, Purdue University, Indiana, United States

09:25 *Novel usage of five-hole probes: Tidal channel turbulence measurements*

A. Young, R.U. Guion, N.R. Atkins and J. Costan

Whittle lab, University of Cambridge, United Kingdom

09:50 *On the impact dimensions of pneumatic probes on the response time*

C. Brüggemann, S. Hobel, M. Schatz and D. Vogt

Institute of Thermal Turbomachinery and Machinery Laboratory (ITSM), University of Stuttgart, Germany

10:15 *Fast settling millimeter-scale five-hole probe*

S. Grimshaw and J.V. Taylor

Whittle lab, University of Cambridge, United Kingdom

10:40-11:00 Coffee break

Session B2 Pressure probes II

Chair: Pavlos Zachos

11:00 *Calibration and implementation of a transient sub miniature 5-hole probe to determine complex flow structures in turbomachines*

T. Zimmermann and M. Wirsum

Institute of Power Plant Technology, Steam and Gas Turbines, RTWH Aachen University, Aachen, Germany

11:25 *A miniature pseudo-multi-hole pressure probe calibration*

F. Ceyhun Sahin and J. Schiffmann

Laboratory of Applied Mechanical Design (LAMD), Swiss Federal Institute of Technology, Lausanne, Switzerland

11:50 *Experimental investigation of geometry effects and performance of five-hole probes in measuring jets in crossflow*

K. Magkoutas, T. Efstathiadis and A.I. Kalfas

Laboratory of Fluid Mechanics and Turbomachinery (LFMT), Aristotle University of Thessaloniki, Thessaloniki, Greece

12:15-13:35 Lunch at IBZ

Session B3 Optical measurements

Chair: Michel Mansour

13:35 *Development and testing of a system for time resolved measurement of droplet spectra in steam turbines*

M. Schatz, T. Eberle and D. Vogt

Institute of Thermal Turbomachinery and Machinery Laboratory (ITSM), University of Stuttgart, Germany

14:00 *Toward embedded optical measurement techniques for precision combustion monitoring in aero-engines*

G. Kraft, F. Giuliani and L. Pfefferkorn

Combustion Bay One e.U., Graz, Austria

14:25 *Complex aero-engine intake aerodynamics - Part I: S-PIV capabilities for inlet flow distortion measurements*

D. Gil Prieto, G. Tanguy, P.K. Zachos and D.G. MacManus

Propulsion Engineering, Cranfield University, United Kingdom

14:50 *Complex aero-engine intake aerodynamics - Part II: Aerodynamic and inlet flow distortion analyses using S-PIV data and DDES simulations*

D. Gil Prieto, G. Tanguy, P.K. Zachos and D.G. MacManus

Propulsion Engineering, Cranfield University, United Kingdom

15:15-15:35 Coffee break

Session B4 **Test facilities**

Chair: Alexandros Terzis

15:35 *Building a low speed research compressor at Seoul National University*

J. Lee, L. Lee and S. Song

Seoul National University, Seoul, South Korea

16:00 *A hands-on student lab for the relation between unsteady aerodynamics and structural dynamics*

J. Dahlqvist and J. Fridh

KTH Royal Institute of Technology, Stockholm, Sweden

16:25 *Development of a transonic linear compressor cascade test facility*

J. Rhee, J. Kim, J. Im and S. Song

Seoul National University, Seoul, South Korea

16:50 **Closing session**

