



**15th Intl CONFERENCE on
VIBRATION MEASUREMENTS by LASER and NONCONTACT TECHNIQUES
ANCONA, ITALY, 21st-23rd June 2023**

FINAL PROGRAMME

WEDNESDAY, 21st June									
08.45	REGISTRATION								
09.15	Room: AULA MAGNA WELCOME by Prof. E.P. Tomasini, President of A.I.V.E.L.A., Italy								
09.30	Room: AULA MAGNA INVITED LECTURE "High-speed camera-based structural identification beyond 1/100.000th of a pixel", <u>Prof. Janko Slavič</u> , University of Ljubljana, Slovenia								
10.20	Room: AULA MAGNA Session 1: THERMOELASTIC STRESS ANALYSIS (TSA) Chairman: Prof. E.P. Tomasini, President of A.I.V.E.L.A., Italy "Marker based motion compensation algorithm of thermal videos for contactless stress measurements using TSA", <u>G. Tribbiani</u> , T. Zara, T. Truffarelli, L. Mercatelli, R. Marsili, University of Padua, Italy "FEM and TSA analysis applied to four different material sections of a CAD/CAM bars", <u>T. Zara</u> , G. Tribbiani, L. Ferranti, G. Rossi, University of Padua, Italy								
11.00	COFFEE BREAK								
11.20	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Room: AULA MAGNA Session 2: ADVANCED NON-CONTACT SENSORS Chairman: Prof. B. Halkon, University of Technology Sydney, Australia</td> <td style="width: 50%; border: none;">Room: AULA N Session 3: STRUCTURAL HEALTH MONITORING Chairman: Dr J. Sauer, Polytec GmbH, Germany</td> </tr> <tr> <td style="border: none;">"Advanced noncontact sensors for Blade tip-timing systems", <u>P. Procházka</u>, M. L. Mekhafia, R. Hodbod', Czech Academy of Sciences, Czech Republic</td> <td style="border: none;">"Enhanced global convolution networks for defect detection in full wavefield imaging", <u>G. Donati</u>, F. Zonzini, L. De Marchi, University of Bologna, Italy</td> </tr> <tr> <td style="border: none;">"Acceleration measurements using FBG sensors: FBG analyzer effects on the acquired signals", <u>A. Vallan</u>, A. Bellone, A. Carullo, S. Corbellini, G. Perrone, Polytechnic University of Turin, Italy</td> <td style="border: none;">"Flyable Mirrors: towards the first airborne laser Doppler vibrometry for large engineering structures", <u>M. A. A. Ismail</u>, R. Zimmermann, M. Schewe, C. Rembe, German Aerospace Center (DLR), Germany</td> </tr> <tr> <td style="border: none;">"Rapid prototyping of FBG-based optical sensors for vibration analysis of mechatronic systems", <u>M. D. L. Dalla Vedova</u>, G. Quattrocchi, A. Aimasso, A. Marotta, C. G. Ferro, P. Maggiore, Polytechnic University of Turin, Italy</td> <td style="border: none;">"A wavefront track approach to defect detection in composites by scanning laser Doppler vibrometry", <u>D. Candelaresi</u>, A. Annessi, G. Allevi, M. Martarelli, P. Castellini, Polytechnic University of Marche, Italy</td> </tr> </table>	Room: AULA MAGNA Session 2: ADVANCED NON-CONTACT SENSORS Chairman: Prof. B. Halkon, University of Technology Sydney, Australia	Room: AULA N Session 3: STRUCTURAL HEALTH MONITORING Chairman: Dr J. Sauer, Polytec GmbH, Germany	"Advanced noncontact sensors for Blade tip-timing systems", <u>P. Procházka</u> , M. L. Mekhafia, R. Hodbod', Czech Academy of Sciences, Czech Republic	"Enhanced global convolution networks for defect detection in full wavefield imaging", <u>G. Donati</u> , F. Zonzini, L. De Marchi, University of Bologna, Italy	"Acceleration measurements using FBG sensors: FBG analyzer effects on the acquired signals", <u>A. Vallan</u> , A. Bellone, A. Carullo, S. Corbellini, G. Perrone, Polytechnic University of Turin, Italy	"Flyable Mirrors: towards the first airborne laser Doppler vibrometry for large engineering structures", <u>M. A. A. Ismail</u> , R. Zimmermann, M. Schewe, C. Rembe, German Aerospace Center (DLR), Germany	"Rapid prototyping of FBG-based optical sensors for vibration analysis of mechatronic systems", <u>M. D. L. Dalla Vedova</u> , G. Quattrocchi, A. Aimasso, A. Marotta, C. G. Ferro, P. Maggiore, Polytechnic University of Turin, Italy	"A wavefront track approach to defect detection in composites by scanning laser Doppler vibrometry", <u>D. Candelaresi</u> , A. Annessi, G. Allevi, M. Martarelli, P. Castellini, Polytechnic University of Marche, Italy
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	<p>"Measurement of plasma jet unsteadiness through high-speed imaging: application to ICP Plasmatron X wind tunnel for hypersonics and aerothermochemistry", <u>L. Capponi</u>, T. Oldham, G. Rossi, M. Panesi, G.S. Elliott, F. Panerai, University of Illinois at Urbana-Champaign, USA</p> <p>"Time-synchronous averaging for improved data retrieval from low quality continuous scanning LDV measurement", M. Mohammadi, <u>B. Halkon</u>, S. Oberst, University of Technology Sydney, Australia</p>
13.00	LUNCH
14.30	<p>Room: AULA MAGNA INVITED LECTURE "Novel Three-dimensional Continuous Scanning Laser Vibrometry for Structures with Arbitrarily Curved Surfaces and Novel Zero-contact Rotating Structure Vibration Measurement", <u>Prof. Weidong Zhu</u>, University of Maryland, Baltimore County, USA</p>
15.20	<p>Room: AULA MAGNA Session 4: H2020 Marie Skłodowska-Curie ECO DRIVE <i>Chairman: Prof. M. Martarelli, Polytechnic University of Marche, Italy</i></p> <p>"Using facial expression recognition to improve sound quality jury testing", <u>R. Jamali</u>, M. Martarelli, P. Chiariotti, G. Battista, A. Generosi, M. Mengoni, J.Y. Villafan, P. Castellini, Polytechnic University of Marche, Italy</p> <p>"On the prediction of the time-varying behavior of dynamic systems by interpolating state-space models", <u>R.S.O. Dias</u>, M. Martarelli, P. Chiariotti, Polytechnic University of Marche, Italy</p>
16.00	COFFEE BREAK
16.20	<p>Room: AULA MAGNA Session 5: LASER DOPPLER VIBROMETRY <i>Chairman: Prof. S. Rothberg, Manchester Metropolitan University, UK</i></p> <p>"Correction of laser doppler vibrometer for non-stationary signals using time domain techniques", Z. Huang, <u>B. J. Halkon</u>, M. Mohammed, Z. Guo, A. Darwish, University of Technology Sydney, Australia</p> <p>"The influence of material's surface modification on the structure's dynamics- initial results", <u>J. Goszczak</u>, G. Mitukiewicz, D. Batory, Lodz University of Technology, Poland</p> <p>"Updates on the measurement of the speed of gravity using LDV and MEMS resonators", <u>I. Cagnani</u>, Linnaeus University, Sweden</p> <p>"Optical characterization of parasitic motion in a long-stroke shaker", <u>J. H. Strait</u>, R. Allen, A. Chijioko, National Institute of Standards and Technology, USA</p> <p>"Squeezed light in sensing applications", <u>J. Südbeck</u>, A. Schönbeck, R. Schnabel, University of Hamburg, Germany</p>
18.00	END of DAY 1
20.00	GALA DINNER at Seepport Hotel

THURSDAY, 22nd June			
08.45	REGISTRATION		
09.15	Room: AULA MAGNA WELCOME by Prof. E.P. Tomasini, President of A.I.V.E.L.A., Italy		
09.30	Room: AULA MAGNA INVITED LECTURE "Combining LDV with flying and moving platforms for flexible measurements on large structures: Joint research of TU Clausthal and the DLR", <u>Prof. Christian Rembe</u> , TU Clausthal, Germany		
10.20	Room: AULA MAGNA Session 6: HIGH-FREQUENCY LDV developed by Prof. Christian Rembe, TU Clausthal, Germany, and Prof. Lei Shao, Shanghai Jiao Tong University, China Chairman: Prof. Christian Rembe, TU Clausthal, Germany "Femtosecond laser Doppler vibrometry for imaging MEMS with ultra-broad spectrum from 1000 Hz to 10 GHz", <u>L. Shao</u> , Z. Peng, J. Cheng, J. Wu, Shanghai Jiao Tong University, China "Signal processing scheme for broad-band heterodyne gigahertz interferometry with a broad-band and a second low-noise photo detector with limited bandwidth", M. Schewe, L. Zhang, <u>C. Rembe</u> , Clausthal University of Technology, Germany "Detection of ultrasonic soundwaves in air via a homodyne Mach-Zehnder interferometer with squeezed-light enhancement", <u>P. Gewecke</u> , J. Zander, R. Schnabel, University of Hamburg, Germany		
11.20	COFFEE BREAK		
11.40	<table border="0"> <tr> <td style="vertical-align: top;"> Room: AULA MAGNA Session 7: PARAMETER IDENTIFICATION FROM LDV-DATA Chairman: Prof. M. D. L. Dalla Vedova, Polytechnic University of Turin Italy "Optimizing the piezoelectric energy harvester for the second eigen frequency: mathematical modeling and experimental investigation of optimal beam shapes", <u>P. Skerys</u>, R. Gaidys, B. Narijauskaite, A. Lupeikiene, Kaunas University of Technology, Lithuania "Identification of damages in a concrete beam: a modal analysis based method", <u>G. Cosoli</u>, M. Martarelli, A. Mobili, F. Tittarelli, G.M. Revel, Polytechnic University of Marche, Italy "Vibro-acoustical operational modal analysis for micro-systems", <u>S. De Carolis</u>, A. Campanale, C. Putignano, L. Soria, G. Carbone, Polytechnic of Bari, Italy </td> <td style="vertical-align: top;"> Room: AULA N Session 8: LDV DETECTORS DEVELOPMENTS Chairman: Prof. Dario Di Maio, University of Twente, The Netherlands "Optical Feedback FM-to-AM conversion with integrated micro-ring resonator for displacement sensing applications", <u>C. Deleau</u>, H. C. Seat, F. Surre, U. Zabit, P.-F. Calmon, O. Berna, LAAS-CNRS, INP-Toulouse, France "Highly-linearized heterodyne self-mixing vibrometer", <u>F. Cavedo</u>, P. Esmaili, <u>A. Pesatori</u>, M. Norgia, Politecnico di Milano, Italy "A variable carrier generation for heterodyne LDV with an optical phase-locked loop", <u>C. Gao</u>, C. Rembe, Clausthal University of Technology, Germany </td> </tr> </table>	Room: AULA MAGNA Session 7: PARAMETER IDENTIFICATION FROM LDV-DATA Chairman: Prof. M. D. L. Dalla Vedova, Polytechnic University of Turin Italy "Optimizing the piezoelectric energy harvester for the second eigen frequency: mathematical modeling and experimental investigation of optimal beam shapes", <u>P. Skerys</u> , R. Gaidys, B. Narijauskaite, A. Lupeikiene, Kaunas University of Technology, Lithuania "Identification of damages in a concrete beam: a modal analysis based method", <u>G. Cosoli</u> , M. Martarelli, A. Mobili, F. Tittarelli, G.M. Revel, Polytechnic University of Marche, Italy "Vibro-acoustical operational modal analysis for micro-systems", <u>S. De Carolis</u> , A. Campanale, C. Putignano, L. Soria, G. Carbone, Polytechnic of Bari, Italy	Room: AULA N Session 8: LDV DETECTORS DEVELOPMENTS Chairman: Prof. Dario Di Maio, University of Twente, The Netherlands "Optical Feedback FM-to-AM conversion with integrated micro-ring resonator for displacement sensing applications", <u>C. Deleau</u> , H. C. Seat, F. Surre, U. Zabit, P.-F. Calmon, O. Berna, LAAS-CNRS, INP-Toulouse, France "Highly-linearized heterodyne self-mixing vibrometer", <u>F. Cavedo</u> , P. Esmaili, <u>A. Pesatori</u> , M. Norgia, Politecnico di Milano, Italy "A variable carrier generation for heterodyne LDV with an optical phase-locked loop", <u>C. Gao</u> , C. Rembe, Clausthal University of Technology, Germany
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	"Analytical and experimental modal analysis of a bladed disk ", <u>P. Procházka</u> , M. L. Mekhafia, Czech Academy of Sciences, Czech Republic	"Self-mixing interferometer: frequency modulation noise dependence on laser source", F. Cavedo, P. Esmaili, <u>A. Pesatori</u> , M. Norgia, Politecnico di Milano, Italy
	"Non-mass loaded excitation technique for precise laser measurements", <u>P. Blaschke</u> , TH Wildau, Germany	"Statistical behavior of detector signals of the laser Doppler vibrometers and its application for signal diversity", <u>F. Wang</u> , C. Rembe, Clausthal University of Technology, Germany
13.20	LUNCH	
14.50	Room: AULA MAGNA INVITED LECTURE "The role of experimental dynamics in an era of Artificial Intelligence", <u>Prof. Dario Di Maio</u> , University of Twente, The Netherlands	
15.40	Room: AULA MAGNA Session 9: MANUFACTURERS' PRESENTATIONS Chairman: Prof. E.P. Tomasini, President of A.I.V.E.L.A., Italy	
16.40	COFFEE BREAK	
17.00	Room: AULA MAGNA SPECIAL SESSION in memory of Prof. David J. Ewins	
17.30	Room: AULA MAGNA Session 10: METROLOGY, CALIBRATION AND STANDARDS developed by Prof. Li Zhang, Changcheng Institute of Metrology and Measurement, China Chairman: Prof. Li Zhang, Changcheng Institute of Metrology and Measurement, China	
	"Research on calibration method for dynamic characteristics of strain sensor", <u>H. Sun</u> , C. Xu, H. Hou, Changcheng Institute of Metrology and Measurement, China	
	"Infrasound sensors calibration by laser pistonphone down to 0.001Hz using ultra low frequency laser interferometer", <u>B. Zhang</u> , J. Xu, Changcheng Institute of Metrology and Measurement, China	
	"Calibration on high-frequency angular vibration using heterodyne laser interferometer based on diffraction grating", <u>D. Zhang</u> , Q. Lyu, X. Li, L. Zhang, J. Xue, Z. Liang, L. Chen, Changcheng Institute of Metrology and Measurement, China	
18.30	END of DAY 2	
19.30	Aperitivo at Guasco Bistrot	

FRIDAY 23rd June

08.45	REGISTRATION
09.15	Room: AULA MAGNA WELCOME by Prof. E.P. Tomasini, President of A.I.V.E.L.A., Italy

09.30	<p>Room: AULA MAGNA</p> <p>Session 11: VISION BASED TECHNIQUES <i>developed in collaboration with Prof. C. Niezrecki, University of Massachusetts Lowell, USA</i> <i>Chairman: Prof. C. Niezrecki, University of Massachusetts Lowell, USA</i></p> <p>"Comparison of different optical techniques to measure skin vibrations", <i>M. Gille, D. J. Rixen, Technical University of Munich, Germany</i></p> <p>"High sensitivity strain measurement on a vibrating saxophone reed using stroboscopic digital image correlation", <i>E. Ukshini, P. Livens, J.J.J. Dirckx, University of Antwerp, Belgium</i></p> <p>"Video motion magnification and estimation for structural dynamics applications", <i>F. Cosco, D. Mastrodicasa, E. Di Lorenzo, Siemens Industry Software NV, Belgium</i></p> <p>"DIC technique for experimental validation of higher order numerical models – A case applied to the Cosserat Continuum model for heterogeneous media", <i>N.P. Thatikonda, D. Baraldi, G. Boscato, A. Cecchi, IUAV University of Venice, Italy</i></p> <p>"Investigation of rotating tires' modal response by using DIC", <i>D. Mastrodicasa, D. Minervini, E. Di Lorenzo, T. Geluk, B. Peeters, P. Guillaume, Siemens Industry Software NV, Belgium</i></p> <p>"Sensor-Based Calibration of Cameras' Extrinsic Parameters for Stereophotogrammetry", <i>F. Bottalico, C. Niezrecki, A. Sabato, University of Massachusetts Lowell, USA</i></p>
11.30	COFFEE BREAK
11.50	<p>Room: AULA MAGNA</p> <p>Session 12: VIBRATIONS AND HEALTH <i>Chairman: Prof. J. Dirckx, University of Antwerp, Belgium</i></p> <p>"Measuring the motion of the eardrum using stroboscopic Digital Image Correlation (strobo-DIC)", <i>P. Livens, E. Ukshini, J. J.J. Dirckx, University of Antwerp, Belgium</i></p> <p>"Laser Doppler Vibrometry for detecting survivors in hard-to-reach environments", <i>L. Antognoli, C. Abonga, L. Panni, G. Cosoli, L. Scalise, Polytechnic University of Marche, Italy</i></p> <p>"Laser Doppler Vibrometry in Biomedical Applications: Extraction of Cardiac-related Features and Comparison with other Measurement Methods", <i>G. Cosoli, G.M. Revel, L. Scalise, Polytechnic University of Marche, Italy</i></p>
12.50	LUNCH
14.00	FINAL GREETINGS & END of CONFERENCE

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