Monday, 25 June 2018

09:00 – 17:00	QIRT Short Courses at BAM conference centre in Berlin-Adlershof
18:00 – 19:30	Get-Together at H4 Hotel (conference venue)

Tuesday, 26 June 2018

	Alexander 3	Grenander 1	Friedrich Wilhelm
09:00	**Opening**		
09:20 – 10:05	**Tu.1.A** **Keynote I** *C. Maierhofer*		
10:30 – 11:50	**Tu.2.A** **Additive Manufacturing I** *S.J. Altenburg*	**Tu.2.B** **Biomedical Applications I** *A. Nowakowski*	**Tu.2.C** **Calibration and Metrology I** *J. Morikawa*
13:00 – 14:00	**Tu.3.A** **Additive Manufacturing II** *V. Carl*	**Tu.3.B** **Biomedical Applications II** *I. Znamenskaya*	**Tu.3.C** **Modelling I** *V. Vavilov*
14:30 – 15:30	**Tu.4.A** **Fluid Dynamics and Energetics I** *G.M. Carlomagno*	**Tu.4.B** **Monitoring and Maintenance** *M. Kreutzbruck*	**Tu.4.C** **Thermophysics** *A. Mendioroz*
16:00 – 17:20	**Tu.5.A** **Fluid Dynamics and Energetics II** *G. Cardone*	**Tu.5.B** **NDT I** *B. Oswald-Tranta*	**Tu.5.C** **Civil Engineering & Buildings I** *J. Dumoulin*
19:30	Welcome Evening at Restaurant “Grand Rocka”		

Wednesday, 27 June 2018

09:00 – 09:45	**We.1.A** **Keynote II** *X. Maldague*		
09:45 – 10:45	**We.2.A** **Novel Technologies** *X. Maldague*		
11:15 – 12:55	**We.3.A** **Grinzato Award** *X. Maldague*	**We.3.B** **Image and Data Processing I** *M.F. Beemer*	**We.3.C** **Industrial Applications I** *M. Goldammer*
14:00 – 15:40	**We.4.A** **Student Award** *G. Busse*	**We.4.B** **Image and Data Processing II** *W. Kim*	**We.4.C** **Industrial Applications II** *P. Burgholzer*
16:10 – 17:10	**We.5.A** **Modelling II** *A. Salazar*	**We.5.B** **Posters with Short Presentation** *C. Maierhofer*	**We.5.C** **Posters with Short Presentation** *E. Thiel*

Thursday, 28 June 2018

	Alexander 3	Grenander 1	Friedrich Wilhelm
09:00 – 09:45	**Th.1.A** **Keynote III** *D.L. Balageas*		
10:15 – 11:35	**Th.2.A** **NDT II** *D.L. Balageas*	**Th.2.B** **Induction Thermography I** *U. Netzelmann*	**Th.2.C** **Thermomechanics I** *G. Mayr*
13:00 – 14:20	**Th.3.A** **NDT III** *V.P. Vavilov*	**Th.3.B** **Calibration and Metrology II** *S. König*	**Th.3.C** **Vibrothermography** *J. Vrana*
14:50 – 16:30	**Th.4.A** **Industrial Applications III** *M. Ziegler*	**Th.4.B** **Induction Thermography II** *B. Wiecek*	**Th.4.C** **Thermomechanics II** *J.-M. Roche*
20:00	Conference Dinner at „Wasserwerk“, Entrance 19:30 h		

Friday, 29 June 2018

08:30 – 09:15	**Fr.1.A** **Keynote IV** *J.-M. Buchlin*		
09:45 – 11:05	**Fr.2.A** **Photothermal Technique** *C. Meola*	**Fr.2.B** **Material Properties** *C. Pradere*	**Fr.2.C** **Civil Engineering & Buildings II** *R. Krankenhagen*
11:30 – 12:50	**Fr.3.A** **NDT IV** *J. Aderhold*	**Fr.3.B** **Image and Data Processing III** *S. Svaic*	**Fr.3.C** **Civil Engineering & Buildings III** *P. Bison*
13:00	Closing		

	Alexander 3	Grenander 1	Friedrich Wilhelm
09:00	**OPENING**		
▶	**Tu.1.A** **KEYNOTE I** *C. Maierhofer*		
09:20	**Tu.1.A.1** The Planetary Spectroscopy Laboratory (PSL) at DLR in Berlin: transmission, reflectance and emissivity spectroscopy from UV to FIR *A. Maturilli [1], J. Helbert [1]* *[1] DLR, Berlin, Germany*		
10:05	Break		
▶	**Tu.2.A** **ADDITIVE MANUFACTURING I** *S.J. Altenburg*	**Tu.2.B** **BIOMEDICAL APPLICATIONS I** *A. Nowakowski*	**Tu.2.C** **CALIBRATION AND METROLOGY I** *J. Morikawa*
10:30	**Tu.2.A.1** Thermal imaging of laser powder interaction zone in Ultra-High Speed Laser Cladding process *P. Koruba [1], J. Reiner [1]* *[1] Wroclaw University of Science and Technology, Wroclaw, Poland*	**Tu.2.B.1** Towards the Diabetic Foot Ulcers Classification with Infrared Thermal Images *R. Vardasca [1], L. Vaz [1], C. Magalhaes [1], A. Seixas [2], J. Mendes [1]* *[1] University of Porto, Portugal; [2] Universidade Fernando Pessoa, Porto, Portugal*	**Tu.2.C.1** Calibration capabilities at PTB for radiation thermometry, quantitative thermography and emissivity *I. Müller [1], A. Adibekyan [1], B. Gutschwager [1], E. Kononogova [1], S. König [1], C. Monte [1], M. Reiniger [1], J. Hollandt [1]* *[1] Physikalisch-Technische Bundesanstalt, Berlin, Germany*
10:50	**Tu.2.A.2** Independent “off – Axis” Monitoring System for the Quality Assessment in Additive Manufacturing *V. Carl [1]* *[1] Carl IR Messtechnik & Prüfsysteme, Dinslaken, Germany*	**Tu.2.B.2** TSR method for burns investigation approach *M. Kaczmarek [1]* *[1] Gdansk University of Technology, Gdańsk, Poland*	**Tu.2.C.2** Nonuniformity correction of infrared camera systems by reading radiance temperatures in theory and practice *S. König [1]* *[1] Physikalisch-Technische Bundesanstalt, Berlin, Germany*
11:10	**Tu.2.A.3** High-Speed Infrared Imaging for Characterization of the Additive Manufacturing Process *A. Huot [1], M.-A. Langevin [1], S. Boubanga [1], P. Lagueux [1], É. Guyot [1]* *[1] Telops, Québec, Canada*	**Tu.2.B.3** Cryotherapy effects measured by infrared thermography in elderly people with rheumatoid arthritis *V. Svaic [1], N. Zura [2]* *[1] University of Applied Health Sciences, Zagreb, Croatia; [2] University Hospital Centre, Zagreb, Croatia*	**Tu.2.C.3** Suitability of contact temperature sensors for kinetic temperature reference measurements in thermography *A. Moya-González [1], J. Garcia-Hierro [2], B. Diezma [1], J.I. Robla [2], N. Oeggerli [1], E.C. Correa [1]* *[1] Universidad Politécnica de Madrid, Spain; [2] Consejo Superior de Investigaciones Científicas, Centro Nacional de Investigaciones Metalúrgicas (CENIM), Madrid, Spain*
11:30	**Tu.2.A.4** Process Monitoring of Additive Manufacturing by Using Optical Tomography *A. Gögelein [1]* *[1] MTU Aero Engines AG, Munich, Germany*	**Tu.2.B.4** Evaluation of patch tests results – development of technique based on infrared thermography *B. Tomaka [1], M. Szwedo [2], J. Targosz [1]* *[1] AGH University of Science and Technology, Kraków, Poland; [2] MONIT SHM Sp. z o.o., Kraków, Poland*	**Tu.2.C.4** High dynamic range for radiometric calibrated infrared cameras *A. Tempelhahn [1], D. Wassilew [1]* *[1] DIAS Infrared GmbH, Dresden, Germany*
11:50	Lunch		

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▶	**Tu.3.A** **ADDITIVE MANUFACTURING II** *V. Carl*	**Tu.3.B** **BIOMEDICAL APPLICATIONS II** *I. Znamenskaya*	**Tu.3.C** **MODELLING I** *V. Vavilov*
13:00	**Tu.3.A.1** Thermophysical property measurements at high-temperatures for power engineering and additive manufacturing processes *J. Hartmann[1], J. Manara[2], M. Zipf[2], T. Stark[2], K. Knopp[1], M. Zänglein[1], P. Lenski[1], E. Schreiber[3], F. Schmidt[4], M. Brunner[5], M. Müller[6], F. Möller[6]* *[1] University of Applied Science Würzburg-Schweinfurt, Schweinfurt, Germany; [2] Bavarian Center for Applied Energy Research (ZAE Bayern), Würzburg, Germany; [3] KE Technologie, Stuttgart, Germany; [4] TechnoTeam Bildverarbeitung GmbH, Illmenau, Germany; [5] Netzsch Gerätebau GmbH, Selb, Germany; [6] Rauscher-Heinersdorf-Pressig GmbH, Pressig, Germany*	**Tu.3.B.1** Simulation of skin properties by a low pass filter for thermal waves: application to thermography-based real-time blood flow imaging *A. Sagaidachnyi[1], A. Fomin[1], D. Usanov[1], A. Skripal[1]* *[1] Saratov State University, Saratov, Russia*	**Tu.3.C.1** On Efficient FE Simulation of Pulse Infrared Thermography for Inspection of CFRPs *S. Hedayatrasa[1], J. Segers[1], J. Andres Calderon Tellez[1], W. Van Paepegem[1], M. Kersemans[1]* *[1] Ghent University, Ghent, Belgium*
13:20	**Tu.3.A.2** Active thermography for quality assurance of 3D-printed polymer structures *C. Metz[1], P. Franz[1], C. Fischer[2], V. Wachtendorf[1], C. Maierhofer[1]* *[1] BAM, Germany; [2] SKZ – Das Kunststoff-zentrum, Würzburg, Germany*	**Tu.3.B.2** Classifying Skin Neoplasms with Infrared Thermal Images *C. Magalhaes[1], R. Vardasca[1], J. Mendes[1]* *[1] University of Porto, Portugal*	**Tu.3.C.2** Continuous and Laplace transformable approximation for the temporal pulse shape of Xe-flash lamps for flash thermography *S. Altenburg[1], R. Krankenhagen[1]* *[1] BAM, Berlin, Germany*
13:40	**Tu.3.A.3** Quality Management of Laser Cladding Processes for Additive Manufacturing by New Methods of Visualization and Evaluation of Thermographic Data *D. Wargulski[1], T. Nowak[2], M. Thiele[3], H. Dobbelstein[3], R. Schacht[2], M. Abo Ras[1]* *[1] Berliner Nanotest und Design GmbH, Berlin, Germany; [2] Brandenburgische Technische Universität, Berlin, Germany; [3] Ruhr-Universität Bochum, Germany;*	**Tu.3.B.3** Measurement by infrared thermography of skin temperature variations in mice undergoing a surgery event *V. Redaelli[1], A. Bosi[1], G. Marsella[2], L. Calvillo[3], G. Grignaschi[2], N. Ludwig[1], F. Luzi[1]* *[1] Università degli Studi, Milano, Italy; [2] IRCCS Istituto di Ricerche Farmacologiche Mario Negri, Animal Care Unit, Milano, Italy; [3] IRCCS Istituto Auxologico Italiano, Laboratory of Cardiac Arrhythmias on Genetic Base, Cusano Milanino, Italy*	**Tu.3.C.3** Numerical simulation of the heat generation process at vibrating contact defects *K. Truyaert[1], S. Delrue[1], V. Aleshin[2], K. Van Den Abeele[1]* *[1] KU Leuven KULAK, Kortrijk, Belgium; [2] Université de Lille, Université de Valenciennes, France*
14:00	Break		
▶	**Tu.4.A** **FLUID DYNAMICS AND ENERGETICS I** *G.M. Carlomagno*	**Tu.4.B** **MONITORING AND MAINTENANCE** *M. Kreutzbruck*	**Tu.4.C** **THERMOPHYSICS** *A. Mendioroz*
14:30	**Tu.4.A.1** Energy efficiency of flight rotary kiln *F. Huchet[1], L. Le Guen[1]* *[1] IFSTTAR, Bouguenais, France*	**Tu.4.B.1** IR thermography for lightning-strike damage monitoring in composite materials *J.-M. Roche[1], F. Passilly[1], P. Beauchêne[1], C. Zaepffel[2], R. Sousa Martins[2], D. Balageas[3]* *[1] ONERA, Châtillon, France; [2] ONERA, Palaiseau, France; [3] I2M, TREFLE, Talence, France*	**Tu.4.C.1** Suitability of Lock-in Infrared Thermography for Luminescent Glass Development *P.W. Nolte[1], N. Ziegeler[2], A.C. Rimbach[2], T. Malvisalo[2], S. Schweizer[1]* *[1] Fraunhofer Application Center for Inorganic Phosphors, Soest, Germany; [2] South Westphalia University of Applied Sciences, Soest, Germany*

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14:50	**Tu.4.A.2** Determination of boiling curve of spray cooling by IR thermography *J.-M. Buchlin[1], J.-B. Gouriet[1], M. Delsipee[1], M. Renard[2]* *[1] von Karman Institute for Fluid Dynamics, Rhode-Saint-Genèse, Belgium; [2] DREVER International, Angleur, Belgium*	**Tu.4.B.2** Infrared thermography as a tool to elaborate procedures for predictive maintenance of ball mills equipment *R. Władysiak[1], T. Pacyniak[1]* *[1] Lodz University of Technology, Lodz, Poland*	**Tu.4.C.2** Measurement of the thermal diffusivity of thin semitransparent polymers by lock-in thermography *N.W. Pech-May[1], A. Philipp[1], M. Retsch[1]* *[1] Universität Bayreuth, Germany*
15:10	**Tu.4.A.3** Evaluation of probe-material interaction in plasma wind tunnel tests by means of IR thermography and thermal inverse modelling *A. Fagnani[1], B. Helber[1], O. Chazot[1], J.-M. Buchlin[1]* *[1] von Karman Institute for Fluid Dynamics, Rhode-Saint-Genèse, Belgium*	**Tu.4.B.3** Applications of different thermographic techniques for NDT and mechanical characterization of materials *A. Ferrara[1], V. E. Palasciano[1], F. Ancona[1], A. Mancuso[1], S. Susca Bonerba[1]* *[1] Diagnostic Engineering Solutions S.r.l., Bari, Italy*	**Tu.4.C.3** Super-cooling of single micron-sized liquid drops in ultra-fast scanning calorimetry measured by micro-scale thermography *J. Morikawa[1], E. Zhuravlev[2], M. Ryu[1], C. Schick[2]* *[1] Tokyo Istitute of Technology, Tokyo, Japan; [2] University of Rostock, Germany*
15:30	Break		
▶	**Tu.5.A** **FLUID DYNAMICS AND ENERGETICS II** *G. Cardone*	**Tu.5.B** **NDT I** *B. Oswald-Tranta*	**Tu.5.C** **CIVIL ENGINEERING & BUILDINGS I** *J. Dumoulin*
16:00	**Tu.5.A.1** Shape Optimisation of Displaced Enhancement Devices for Heat Transfer Augmentation by Inverse Problem Approach Applied to Infrared Images *F. Bozzoli[1], L. Cattani[1], A. Mocerino[1], S. Rainieri[1], I. Tougri[2], M. Colaço[2]* *[1] University of Parma, Italy; [2] Federal University of Rio de Janeiro, Brazil*	**Tu.5.B.1** Combining the spectral information of Dual-Band images to enhance contrast and reveal details *S. Quirin[1], H.-G. Herrmann[2]* *[1] Saarland University, Saarbrücken, Germany; [2] Fraunhofer IZFP, Saarbrücken, Germany*	**Tu.5.C.1** Autonomous thermography: towards the automatic detection and classification of building pathologies *I. Garrido[1], S. Lagüela[1], P. Arias[1]* *[1] University of Vigo, Spain; University of Salamanca, Ávila, Spain*
16:20	**Tu.5.A.2** Estimating turbulent boundary layer characteristics by high-speed infrared thermography *E. Koroteeva[1], I. Znamenskaya[1], A. Novinskaya[1]* *[1] Lomonosov Moscow State University, Moscow, Russia*	**Tu.5.B.2** Thermographic image reconstruction of damaged composite materials using the virtual wave concept *G. Mayr[1], P. Burgholzer[2], G. Stockner[1], J. Gruber[1], G. Hendorfer[1]* *[1] University of Applied Sciences Upper Austria, Wels, Austria; [2] Research Center for Non Destructive Testing (RECENDT), Linz, Austria*	**Tu.5.C.2** Reference-free Coating Thickness Visualization using Laser Thermography under Various Exterior Temperature Conditions *S. Hwang[1], J. Park[1], Z. Jin[1], H. Sohn[1]* *[1] KAIST, Daejeon, South Korea*
16:40	**Tu.5.A.3** Micro-scale temperature measurement at the co-flow interface in the micro-fluidics device *M. Ryu[1], T. Sato[1], S. Kirchner[2], M. Romano[2], J.-C. Batsale[2], C. Pradere[2], J. Morikawa[1]* *[1] Tokyo Institute of Technology, Tokyo, Japan; [2] I2M, TREFLE, Talence, France*	**Tu.5.B.3** Infrared and Terahertz time-domain spectroscopy for impacted thick homogeneous particleboards of sugarcane bagasse evaluation *H. Zhang[1], S. Sfarra[2], A. Osman[3], K. Szielasko[3], C. Stumm[3], F. Sarasini[4], X. Maldague[1]* *[1] Laval University, Quebec, Canada; [2] University of L'Aquila, Italy; [3] Fraunhofer IZFP, Saarbrücken, Germany; [4] Sapienza University of Rome, Italy*	**Tu.5.C.3** Numerical applications for experimental IRT in defective multilayered building systems *C. Serra[1], A. Tadeu[1], N. Simões[1]* *[1] ITeCons, Coimbra, Portugal*
17:00		**Tu.5.B.4** Comparative study of active infrared thermography, laser vibrometry and laser ultrasound techniques in application to the inspection of graphite/epoxy composite parts *V. Vavilov[1], A. Karabutov[2,3,4], A. Chulkov[1], D. Derusova[1], A. Moskovchenko[1], E. Cherepetskaya[3], E. Mironova[3]* *[1] Tomsk Polytechnic University, Tomsk, Russia; [2] Lomonosov Moscow State University, Moscow, Russia; [3] NUST MISIS, Moscow, Russia; [4] ILIT RAS, Shatura, Russia*	**Tu.5.C.4** Application of Multidisciplinary Non-Destructive Techniques (NDT) on a Structure *G. Kilic[1]* *[1] Yasar University, Izmir, Turkey*
19:30	Welcome Evening at „Grand Rocka“		

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▶	**We.1.A** **KEYNOTE II** *X. Maldague*		
09:00	**We.1.A.1** Lock-in Thermography for analyzing solar cells and failure analysis in other electronic components O. Breitenstein [1], S. Sturm [2] [1] Max Planck Institute of Microstructure Physics, Halle (Saale), Germany; [2] InfraTec GmbH, Dresden, Germany		
▶	**We.2.A** **NOVEL TECHNOLOGIES** *X. Maldague*		
09:45	**We.2.A.1** State of the art NDT with active thermography solutions P. Menner [1], C. Srajbr [1], J. Frey [1] [1] edevis GmbH, Stuttgart, Germany		
09:55	**We.2.A.2** Application of fix cameras in Process control and fire detection R. Ricca [1] [1] INPROTEC IRT S.r.l., Cinisello Balsamo, Italy		
10:05	**We.2.A.3** New Dimensions in Micro Thermography S. Sturm [1] [1] InfraTec GmbH, Dresden, Germany		
10:15	**We.2.A.4** Infrared Cameras for Scientific Applications O. Schreer [1] [1] IRCAM GmbH, Erlangen, Germany		
10:25	**We.2.A.5** Breaking the boundaries K. Jacobs [1] [1] FLIR Systems, Meer, Belgium		
10:35	**We.2.A.6** Smart IR Camera for NDT with Active Thermography C. Ferber [1] [1] AT – Automation Technology GmbH, Bad Oldesloe, Germany		
10:45	Break		
▶	**We.3.A** **GRINZATO AWARD** *X. Maldague*	**We.3.B** **IMAGE AND DATA PROCESSING I** *M.F. Beemer*	**We.3.C** **INDUSTRIAL APPLICATIONS I** *M. Goldammer*
11:15	**We.3.A.1** Coupling Pulsed Flying Spot technique with robot automation for industrial thermal characterization A. Sommier [1], J. Malvaut [2], V. Delos [1], M. Romano [3], T. Bazire [2], J.-C. Batsale [1], A. Mendioroz [4], A. Oleaga [4], C. Pradere [1] [1] I2M, Talence, France; [2] KUKA Aerospace Group, Le haillan, France; [3] EPSILON – Groupe ALCEN, Talence, France; [4] Universidad del País Vasco, Bilbao, Spain	**We.3.B.1** NDT Inspection of Aeronautical Components by Projected Thermal Diffusivity Analysis P. Venegas [1], J. Perán [1], R. Usamentiaga [2], I. Sáez de Ocáriz [3] [1] National Distance Education University, Madrid, Spain; [2] University of Oviedo, Spain; [3] Aeronautical Technologies Centre (CTA), Miñano, Spain	**We.3.C.1** Assessment of Oxide Descaler Functionality in a Steel Hot Strip Mill Using Infrared Video Imaging J.B. Wiskel [1], A. Linchieh [1], H. Henein [1] [1] University of Alberta, Edmonton, Canada

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11:35	**We.3.A.2** Blind structured illumination as excitation for super-resolution photothermal radiometry *P. Burgholzer[1], T. Berer[1], M. Ziegler[2], E. Thiel[2], S. Ahmadi[2], J. Gruber[3], G. Mayr[3], G. Hendorfer[3]* *[1] Research Center for Non Destructive Testing (RECENDT), Linz, Austria; [2] BAM, Berlin, Germany; [3] Josef Ressel Centre for Thermal NDE of Composites, University of Applied Sciences Upper Austria, Wels, Austria*	**We.3.B.2** Comparative study of Principal Component Analysis and Discrete Fourier Transform for internal defects detection in metallic sample using Pulsed eddy current thermography *A. Taram[1,2], J.-L. Bodnar[2], C. Roquelet[1], P. Meilland[1], M. Anderhuber[1], T. Duvaut[2]* *[1] ArcelorMittal, Maizières-lès-Metz, France; [2] Université de Reims, France*	**We.3.C.2** Assessment of eggs freshness by means of pulsed infrared thermography *F. Freni[1], A. Quattrocchi[1], A. Di Giacomo[1], S. Piccolo[2], R. Montanini[1]* *[1] University of Messina, Italy; [2] Technical University of Denmark, Lingby, Denmark*
11:55	**We.3.A.3** Characterization of open cracks in burst vibrothermography experiments *K. Martínez[1], A. Mendioroz[2], R. Celorrio[3]* *[1] Instituto Politécnico Nacional, (IPN), Centro de Investigación en Ciencia Avanzada y Tecnología Avanzada (CICATA), Ciudad de México, Mexico; [2] Universidad del País Vasco, Bilbao, Spain; [3] Universidad de Zaragoza, Spain*	**We.3.B.3** Processing of Pulse Thermography Data for Improved Probing Depth *G. Olafsson[1]* *[1] University of Southampton, United Kingdom*	**We.3.C.3** Increasing the HPDC process quality and control with the use of a modern thermographic system. *R. Ricca[1]* *[1] INPROTEC IRT S.r.l., Cinisello Balsamo – Milan, Italy*
12:15	**We.3.A.4** Monitoring of Hemodynamics in Human Skin Using Pulsed Photothermal Radiometry and Optical Spectroscopy *N. Verdel[1], B. Majaron[1,2]* *[1] Jožef Stefan Institute, Ljubljana, Slovenia; [2] University of Ljubljana, Slovenia*	**We.3.B.4** Comparison of optimization strategies for the improvement of depth detection capability of Pulse Compression Thermography *H. Malekmohammadi[1], S. Laureti[1], L. Senni[1], P. Burrascano[1], M. Ricci[2]* *[1] University of Perugia, Terni, Italy; [2] University of Calabria, Rende, Italy*	**We.3.C.4** Suitability of Infrared Thermography for Monitoring the Hot Extrusion of Insulating Materials *J. Aderhold[1], P. Meinlschmidt[1], F. Schlüter[1]* *[1] Fraunhofer Institute for Wood Research, Braunschweig, Germany*
12:35		**We.3.B.5** Pulsed Thermography: evaluation and quantitative analysis of defects through different post-processing algorithms *E. D'Accardi[1], R. Tamborrino[1], D. Palumbo[1], P. Cavallo[1], U. Galietti[1]* *[1] Politecnico di Bari, Italy*	**We.3.C.5** Thermographic method for quantifying in-plane non-uniform paper drying *A. Tysén[1]* *[1] RISE Bioeconomy, Stockholm, Sweden*
12:55	Lunch		
▶	**We.4.A** **STUDENT AWARD** *G. Busse*	**We.4.B** **IMAGE AND DATA PROCESSING II** *W. Kim*	**We.4.C** **INDUSTRIAL APPLICATIONS II** *P. Burgholzer*
14:00	**We.4.A.1** Capability of THz for Thermo-transmittance/water content measurements of insulating materials: heat and mass transfer *M. Bensalem[1], A. Sommier[1], J.-C. Mindeguia[2], J.-C. Batsale[1], C. Pradere[1]* *[1] I2M/TREFLE, Talence, France; [2] I2M/GCE, Talence, France*	**We.4.B.1** Sublayer composition evaluation of Artwork using active thermography *G. Steenackers[1], J. Peeters[1], K. Janssens[1]* *[1] University of Antwerp, Belgium*	**We.4.C.1** Online infrared thermography: Application to filament winding process defects detection *O. Colas[1], B. Courtemanche[1], A. Le Reun[1]* *[1] CETIM, Nantes, France*
14:20	**We.4.A.2** NDT of Layered Structures Using Pulse-Thermography and THz-TDS Imaging *J. Frisch[1], D. Wu[2], L. Sripragash[3], C. Gleichweit[4], M. Mei[4], M. Goldammer[1]* *[1] Siemens AG, München, Germany; [2] Munich University of Applied Sciences, München, Germany; [3] Siemens Inc., Charlotte, USA; [4] Menlo Systems GmbH, Martinsried, Germany*	**We.4.B.2** Assessing plant water status from infrared thermography for irrigation management *I. Boras[1], S. Švaić[1], M. Zovko[2]* *[1] Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia; [2] Faculty of agriculture, Zagreb, Croatia*	**We.4.C.2** Advanced Monitoring Systems for Smart Tooling in Aeronautical Industry 4.0 *P. Venegas[1], G. Durana[2], J. Zubia[2], I. Sáez de Ocáriz[1]* *[1] Aeronautical Technologies Centre, Miñano, Spain; [2] University of the Basque Country, Bilbao, Spain*

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14:40	**We.4.A.3** Investigation of supersonic, large wall roughness elements with QIRT and PIV *N. Voogt[1], B. van Oudheusden[1], F. Schrijer[1]* *[1] Delft University of Technology, Delft, Netherlands*	**We.4.B.3** Université Laval Face Motion and Time-Lapse Video Database (UL-FMTV) *R. Shoja Ghiass[1], H. Bendada[1], X. Maldague[1]* *[1] Universite Laval, Quebec, Canada*	**We.4.C.3** Automated single view 3D Texture Mapping and Defect Localisation of Thermography Measurements on large Components utilising an industrial robot and a laser system *S. Dutta[1], K. Drechsler[2], M. Kupke[1], A. Schuster[1], J.-P. Tuppatsch[1]* *[1] DLR e.V., Augsburg, Germany; [2] Technical University of Munich, Germany*
15:00	**We.4.A.4** BRDF (Bidirectional Reflectivity Distribution Function) modelling for accuracy enhanced thermoreflectometry *B. Javaudin[1], R. Gilblas[1], T. Sentenac[1], L.M. Yannick[1]* *[1] Université de Toulouse, Albi, France*	**We.4.B.4** Exploring Deep Learning Networks for Tumour Segmentation in Infrared Images *A. Dalmia[1], S.T. Kakileti[2], G. Manjunath[2]* *[1] Indian Institute of Technology, Guwahati, India; [2] NIRAMAI Health Analytix Pvt Ltd, Bangalore, India*	**We.4.C.4** Contact temperature measurement by infrared thermography during resistance spot welding process *T. Pierre[1], E. Geslain[1], P. Rogeon[1], C. Pouvreau[1], L. Cretteur[2]* *[1] Université Bertagne Sud, Lorient, France; [2] ArcelorMittal Global R&D, Montataire, France*
15:20	**We.4.A.5** Correlation between wall temperature and flow field of an impinging chevron jet *M. Contino[1], C.S. Greco[1], T. Astarita[1], G. Cardone[1]* *[1] University of Naples Federico II, Naples, Italy*	**We.4.B.5** Novel software for medical and technical Thermal Object Identification TOI using dynamic temperature measurements by fast IR cameras *M. Strakowska[1], P. Chatzipanagiotou[2], P. Wiecek[1], G. De Mey[3], V. Chatziathanasiou[2], B. Wiecek[1]* *[1] Lodz University of Technology, Lodz, Poland; [2] Aristotle University of Thessaloniki, Thessaloniki, Greece; [3] Gent University, Gent, Belgium*	**We.4.C.5** Numerical study of laser line thermography for crack detection at high temperature *N. Puthiyaveettil[1], R. Kidangan[1], S. Unnikrishnakurup[2], C.v. Krishnamurthy[1], M. Ziegler[2], P. Myrach[2], K. Balasubramaniam[1]* *[1] Indian Institute of Technology Madras , Chennai, India; [2] BAM, Berlin, Germany*
15:40	Break		
▶	**We.5.A** **MODELLING II** *A. Salazar*	**We.5.B** **POSTERS WITH SHORT PRESENTATION** *C. Maierhofer*	**We.5.C** **POSTERS WITH SHORT PRESENTATION** *E. Thiel*
16:10	**We.5.A.1** An Efficient Numerical Method for Surface Relief Grating Design of Resonance Quantum Well Infrared Photodetectors *C.-C. Huang[1], C. Nien[1], B.-W. Liang[1], B.-M. Chen[1], S.-P. Chao[1], T. Yang[1], S.-Y. Lo[1], C.-C. Lee[1], C.-H. Kuan[1]* *[1] National Taiwan University, Taipei, Taiwan (Republic of China)*	**P22** 16:10 Infrared Diagnostic for Safe Plasma Operation at Wendelstein 7-X *A. Ali[1], M. Jakubowski[1], T. Sunn Pedersen[1], R. Neu[2], P. Drewelow[1], A. Puig Sitjes[1]* *[1] Max Planck Institute for Plasma Physics, Greifswald, Germany; [2] Max Planck Institute for Plasma Physics, Garching, Germany*	**P1** 16:10 Study of the evolution of the mechanical properties of orthodontic arches by stimulated infrared thermography *N. Chahine[1], K. Mouhoubi[1], A. Diakhate[1], S. Harakeh[2], P. Millet[1], J.-L. Bodnar[1]* *[1] University of Reims, France; [2] King Fahd Medical Research Center; King Abdulaziz University, Jeddah, Saudi Arabia*
16:30	**We.5.A.2** Pulse thermography model-based inversion *S. Holland[1]* *[1] Center for Nondestructive Evaluation, Iowa State University, Ames, USA*	**P23** 16:15 Approaches for quantitative study of divertor heat loads on W7-X *Y. Gao[1], M. Jakubowksi[2], P. Drewelow[2], F. Pisano[3], A. Puig Sitjes[2], H. Niemann[2], A. Ali[2], M. Rack[1]* *[1] Forschungszentrum Jülich, Germany; [2] Max-Planck-Institut für Plasmaphysik, Greifswald, Germany; [3] University of Cagliari, Italy*	**P15** 16:15 SI traceable measurement of the spectral responsivity of thermal detectors in the wavelength range from 1.5 µm to 10.6 µm by using a cryogenic radiometer at PTB *P. Meindl[1], D. Taubert[1], U. Johannsen[1], T. Pohl[1], L. Werner[1], E. Kosubek[1]* *[1] Physikalisch-Technische Bundesanstalt, Berlin, Germany*
16:50	**We.5.A.3** Objects parameters estimation based on optimization algorithms in active infrared thermogaphy *B. Grochowalska[1]* *[1] West Pomeranian University of Technology, Szczecin, Poland*	**P26** 16:20 Application of wavelets to improvement of defects visibility in active thermography *M. Kurpiński[1], M. Fidali[1]* *[1] Silesian University of Technology, Gliwice, Poland*	**P24** 16:20 Infrared Micro Thermography of High-Power AlInGaN LEDs Using High Emissivity (black) Coating in IR and Transparent in the Visible Spectral Region *A. Zakgeim[1], A. Chernyakov[1], A. Aladov[1]* *[1] Russian Academy of Sciences, Saint-Petersburg, Russia*

P27 16:25

Application of Deep Learning in Infrared Non-Destructive Testing

B. Yousefi[1], D. Kalhor[1], R. Usamentiaga[2], L. Lei[1], C. Ibarra-Castanedo[1], X. Maldague[1]
[1] Laval University, Quebec, Canada;
[2] University of Oviedo, Gijón, Spain

P28 16:30

Subsurface Defect Evaluation in Additive Manufacturing Process using Pulsed Induction Thermography

O. Ghibaudo[1]
[1] SAFRAN SA, Châteaufort, France

P40 16:35

Thermal Diffusivity Measurements With Flash Method at Different Depths In a Burned Composite Material

S.-O. Gnessougou[1], N. Poulin[1], C. Ibarra-Castanedo[1], X. Maldague[1], A. de Champlain[1], É. Robert[2]
[1] Université Laval, Québec, Canada;
[2] Polytechnique Montréal, Canada

P43 16:40

Evaluation of water diffusion into wood material using Speckle pattern and active thermography

F. Madruga[1], S. Sfarra[2], J. Černecký[3], S. Perilli[2], E. Pivarčiová[3], J.M. López-Higuera[1]
[1] Universidad de Cantabria, Santander, Spain; [2] University of L'Aquila, Italy;
[3] Technical University in Zvolen, Slovakia

P44 16:45

Active thermography using a dynamic excitation for NDT applied to large target

F.J. Madruga[1], A. Rodero[1], G. Fernández-Barreras[1], S. Sfarra[2], J.M. López-Higuera[1]
[1] Universidad de Cantabria, Santander, Spain; [2] University of L'Aquila, Italy

P51 16:50

Three-dimensional thermographic reconstruction of embedded heat sources by means of virtual waves

G. Stockner[1], G. Mayr[1], J. Gruber[1], P. Burgholzer[2], G. Hendorfer[1]
[1] University of Applied Sciences Upper Austria, Wels, Austria; [2] Research Center for Non Destructive Testing (RECENDT), Linz, Austria

P20 16:25

The continuous thermal imaging of the flood embankment to identify location of the leaks

B. Bukowska-Belniak[1], A. Borecka[1], A. Leśniak[1]
[1] AGH University of Science and Technology, Krakow, Poland

P35 16:30

Comparison of MWIR thermography and high-speed NIR thermography in a laser metal deposition (LMD) process

S.J. Altenburg[1], C. Maierhofer[1], A. Straße[1], A. Gumenyuk[1]
[1] BAM, Berlin, Germany

P36 16:35

Application of thermal imaging system for prediction of fatigue crack initiation in Ti-6Al-4V fabricated by EBM

P. Koruba[1], M. Karoluk[1], G. Ziółkowski[1], E. Chlebus[1]
[1] Wroclaw University of Science and Technology, Wroclaw, Poland

P38 16:40

Comparison between multi-frequency and multi-speed laser lock-in thermography methods for the evaluation of crack depths in metal

C. Boué[1], S. Holé[1]
[1] Sorbonne Université, Paris, France

P45 16:45

Lock-in Thermography using High-Power Laser Sources

M. Ziegler[1], S. Ahmadi[1], E. Thiel[1]
[1] BAM, Berlin, Germany

P31 16:50

FeO content estimation in the steel slag using Raman spectroscopy in NIR range

I. Shatarah[1], A. Imiela[2], J. Surmacki[2], R. Olbrycht[1], W. Wittchen[3], M. Borecki[3], H. Abramczyk[2], B. Więcek[1]
[1] Technical University of Lodz, The Institute of Electronics, Lodz, Poland; [2] Lodz University of Technology, Institute of Applied Radiation Chemistry, Lodz, Poland; [3] Institute for Ferrous Metallurgy, Gliwice, Poland

P52 16:55

Modeling of Spontaneous Raman Scattering in silica light guides for Distributed Temperature Sensing

I. Shatarah[1], R. Olbrycht[1], B. Więcek[1]
[1] Technical University of Lodz, The Institute of Electronics, Lodz, Poland

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▶	**Th.1.A** **KEYNOTE III** *D.L. Balageas*		
09:00	**Th.1.A.1** Lock-in inductive thermography for surface crack detection in non-magnetic metals *B. Oswald-Tranta [1], C. Tuschl [1]* *[1] University of Leoben, Austria*		
09:45	Break		
▶	**Th.2.A** **NDT II** *D.L. Balageas*	**Th.2.B** **INDUCTION THERMOGRAPHY I** *U. Netzelmann*	**Th.2.C** **THERMOMECHANICS I** *G. Mayr*
10:15	**Th.2.A.1** Development of Virtual Illumination Functions for Thermographic NDT *P. Venegas [1], J. Perán [1], R. Usamentiaga [2], I. Sáez de Ocáriz [3]* *[1] National Distance Education University, Madrid, Spain; [2] University of Oviedo, Spain; [3] Aeronautical Technologies Centre, Miñano, Spain*	**Th.2.B.1** Evaluation of Paint Coating on Metal Elements Using Scanning Pulsed Eddy Current Thermography *W. Świderski [1], P. Hlosta [1]* *[1] Military Institut of Armament Technology, Zielonka, Poland*	**Th.2.C.1** Lock-in thermography as a tool for fatigue damage monitoring of composite structures *J.-M. Roche [1], B. Lamboul [1], G. Bai [1], L. Muller [1], P. Paulmier [1], D. Balageas [2]* *[1] ONERA, Châtillon, France; [2] I2M, TREFLE, Talence, France*
10:35	**Th.2.A.2** Measuring the thermal resistance of vertical interfaces separating two different media using lock-in infrared thermography with laser spot excitation *A. Bedoya [1], J. Gonzalez [1], A. Mendioroz [1], A. Salazar [1]* *[1] Universidad del Pais Vasco, Bilbao, Spain*	**Th.2.B.2** Characterization of slanted buried planar heat sources using time domain Infrared Thermography *A. Mendioroz [1], A. Salazar [1], K. Martínez [2], Á. Cifuentes [2], E. Marín [2], R. Celorrio [3], P. Venegas [4], I. Sáez de Ocáriz [4]* *[1] Universidad del País Vasco, Bilbao, Spain; [2] Instituto Politécnico Nacional (IPN) Centro de Investigación en Ciencia Avanzada y tecnología Avanzada (CICATA), Mexico City, Mexico; [3] University of Zaragoza, Spain; [4] Centro de tecnologías Aeronáuticas (CTA), Miñano, Spain*	**Th.2.C.2** Quantification of impact damages in CFRP and GFRP structures with thermography and ultrasonics *C. Maierhofer [1], R. Krankenhagen [1], M. Röllig [1], T. Heckel [1], D. Brackrock [1], M. Gaal [1]* *[1] BAM, Berlin, Germany*
10:55	**Th.2.A.3** Reduced inspection time in active thermographic non-destructive testing of low-thermal-conductivity materials *M. Ishikawa [1], M. Koyama [2], H. Kasano [3], H. Hatta [4], S. Utsunomiya [4]* *[1] Tokushima University, Tokushima, Japan; [2] Meisei University, Tokyo, Japan; [3] Nihon University, Fukushima, Japan; [4] Japan Aerospace Exploration Agency, Kanagawa, Japan*	**Th.2.B.3** Comparison of inductive shearography and thermography for flaw detection in structural adhesives on ideal and application-oriented specimen *I. Kryukov [1], M. Kahlmeyer [1], S. Böhm [1]* *[1] University of Kassel, Germany*	**Th.2.C.3** Evaluation of thermo-elastic behavior of an high alloyed steel by a Fourier transformation based Lock-In-Thermography *R. Urbanek [1], J. Bär [1]* *[1] University of the Federal Armed Forces Munich, Neubiberg, Germany*
11:15	**Th.2.A.4** Active Thermography with frequency modulated source *P. Bison [1], A. Bortolin [1], G. Cadelano [1], G. Ferrarini [1], L. Finesso [2]* *[1] CNR-ITC, Padova, Italy; [2] CNR-IEIIT, Padova, Italy*	**Th.2.B.4** A novel Automatic Defect Detection Method for Electron Beam Welded Inconel 718 Components using Inductive Thermography *E. Gorostegui Colinas [1], A. Muniategui [1], P. López de Uralde [1], I. Gorosmendi [1], B. Hériz [1], X. Sabalza [1]* *[1] IK4-LORTEK, Ordizia, Spain*	**Th.2.C.4** Infrared thermography to inline monitoring of glass fibres based composites under impact and quasi-static bending tests *S. Boccardi [1], G.M. Carlomagno [1], C. Meola [1], P. Russo [2], G. Simeoli [2]* *[1] University of Naples Federico II, Napoli, Italy; [2] CNR, Pozzuoli, Italy*
11:35	Lunch		

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▶	**Th.3.A** **NDT III** *V.P. Vavilov*	**Th.3.B** **CALIBRATION AND METROLOGY II** *S. König*	**Th.3.C** **VIBROTHERMOGRAPHY** *J. Vrana*
13:00	**Th.3.A.1** Optothermal detection of subsurface graphical features in artworks *S. Paoloni[1], F. Mercuri[1], N. Orazi[1], C. Cicero[1], U. Zammit[1]* *[1] Università degli Studi di Roma Tor Vergata, Rome, Italy*	**Th.3.B.1** Fusion of TLS and RGB point clouds with TIR images for indoor mobile mapping *L. Hoegner[1], T. Abmayr[2], D. Tosic[1], S. Turzer[2], U. Stilla[1]* *[1] Technical University Munich, Germany; [2] University of Applied Sciences Munich, Germany*	**Th.3.C.1** Effect of vibro-acoustic nonlinearity on thermosonic response of damage *I. Solodov[1], M. Kreutzbruck[1]* *[1] IKT University of Stuttgart, Germany*
13:20	**Th.3.A.2** 3D reconstruction of tilted cracks using infrared thermography and the virtual wave concept *S. Waters[1], P. Burgholzer[1], A. Mendioroz[2], I. Sáez de Ocáriz[3]* *[1] Research Center for Non Destructive Testing (RECENDT), Austria; [2] Universidad del País Vasco, Bilbao, Spain; [3] Centro de Tecnologías Aeronáuticas (CTA), Miñano, Spain*	**Th.3.B.2** Novel instrumentation of thermo-spectroscopy; combination of reflectance and transmittance mode applied to the crystallization process on the nano-membrane *M. Ryu[1], J. Morikawa[1]* *[1] Tokyo Institute of Technology, Tokyo, Japan*	**Th.3.C.2** Impact Damage Sizing with Resonant Frequency Sweep Thermography *M. Rahammer[1], M. Kreutzbruck[1]* *[1] IKT University of Stuttgart, Germany*
13:40	**Th.3.A.3** A new method for surface crack detection by laser thermography based on Thermal Barrier effect *P. López de Uralde[1], E. Gorostegui-Colinas[1], A. Muniategui[1], I. Gorosmendi[1], B. Hériz[1], M. Ayuso[1], X. Sabalza[1]* *[1] IK4-LORTEK, Ordizia, Spain*	**Th.3.B.3** Transient infrared thermography to characterize thermal properties of millimeter-sized low conductivity materials *T. Pierre[1], M. Carin[1], M. Courtois[1], P. Carré[1]* *[1] Université Bretagne Sud, Lorient, France*	**Th.3.C.3** Characterization of buried heat sources using Dirac excitation *M.-M. Groz[1], A. Meziane[1], R. Celorrio[2], A. Mendioroz[3], A. Salazar[3], C. Pradère[1]* *[1] I2M, Talence, France; [2] Universidad de Zaragoza, Spain; [3] Universidad del Pais Vasco, Bilbao, Spain*
14:00	**Th.3.A.4** Independent Component Thermography for Subsurface Defect Detection *J.-Y. Wu[1], S. Sfarra[2], H.-L. Wen[1], Y. Yao[1]* *[1] National Tsing Hua University, Hsinchu, Taiwan (Republic of China); [2] University of L'Aquila, Italy*		**Th.3.C.4** Interaction between Ultrasound Waves and Defects in Sonic Infrared Imaging NDE *X. Han[1]* *[1] Wayne State University, Detroit, USA*
14:20	Break		

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▶	**Th.4.A** **INDUSTRIAL APPLICATIONS III** *M. Ziegler*	**Th.4.B** **INDUCTION THERMOGRAPHY II** *B. Wiecek*	**Th.4.C** **THERMOMECHANICS II** *J.-M. Roche*
14:50	**Th.4.A.1** Optimised dynamic line scanning thermography for aircraft structures *J. Peeters [1], S. Verspeek [1], S. Sels [1], B. Bogaerts [1], G. Steenackers [1]* *[1] Universiteit Antwerpen, Belgium*	**Th.4.B.1** Research on eddy current pulsed thermography for Squats in railway *L-f. Feng [1], J.-p. Peng [1], K. Zhang [1], J. Bai [1] X.-r. Gao [1]* *[1] Southwest Jiaotong University, Chengdu, China*	**Th.4.C.1** Thermographic detection of damage initiation of cyclically loaded parts *M. Švantner [1], J. Skála [1], L. Muzika [1], P. Čížek [2]* *[1] University of West Bohemia, Plzeň, Czech Republic; [2] MATERIÁLOVÝ A METALURGICKÝ VÝZKUM, Ostrava, Czech Republic*
15:10	**Th.4.A.2** Inspection of HVOF-coated Pelton turbine using laser thermography *J. Délémontez [1], Y. Caulier [2], M. Taglione [2], T. Busalb [1], E. Martin [3]* *[1] Électricité de France, Grenoble, France; [2] Framatome-intercontrôle, Chalon sur Saône, France; [3] Électricité de France, Saint-Denis, France*	**Th.4.B.2** Induction thermography on CFRP and the role of anisotropy *U. Netzelmann [1], J. Guo [2]* *[1] Fraunhofer IZFP, Saarbrücken, Germany; [2] Southwest Jiaotong University, Chengdu, China*	**Th.4.C.2** Infrared thermography online 1D and offline 2D evaluation of mechanical properties at cycling fatigue testing *J. Tesař [1], M. Švantner [1], J. Skála [1], M. Novák [2]* *[1] University of West Bohemia, Plzeň, Czech Republic; [2] Research and Testing Institute Plzeň, Czech Republic*
15:30	**Th.4.A.3** Nondestructive control of a mine shaft cast iron concrete lining by active infrared thermography *M. Zhelnin [1], O. Plekhov [1], A. Zaicev [2], L. Levin [2]* *[1] ICMM UB RAS, Perm, Russia; [2] MI UB RAS, Perm, Russia*	**Th.4.B.3** Detection of surface cracks in metals under coatings by induction thermography *Y. Wang [1], X. Gao [1], U. Netzelmann [2]* *[1] Southwest Jiaotong University, Chengdu, China; [2] Fraunhofer IZFP, Saarbrücken, Germany*	**Th.4.C.3** Characterization of the fatigue behaviour and lifetime evaluation of metallic materials based on thermographic NDT-methods *H. Wu [1], P. Starke [1], C. Boller [1]* *[1] Saarland University, Saarbrücken, Germany*
15:50	**Th.4.A.4** Comparative study of Line Scan and Flying Line Active IR Thermography operated with a 6-axe robot *Y. Mokhtari [1], L. Gavérina [2,3], C. Ibarra-Castanedo [1,4], M. Klein [4], P. Servais [5], J. Dumoulin [2,3], X. Maldague [1]* *[1] Laval University, Québec, Canada; [2] Ifsttar, Bouguenais, France; [3] Inria, Rennes, France; [4] Visiooimage, Québec, Canada; [5] NDT Pro-WAN, Libramont-Gosselies, Belgium*	**Th.4.B.4** Active Thermography with Electromagnetic Excitation: Defect-Specific Warming and Underlying Current Flow *J. Vrana [1], M. Goldammer [2]* *[1] VRANA GmbH, Rimsting, Germany; [2] Siemens AG, Munich, Germany*	**Th.4.C.4** Gum Metal under cyclic tension inspected by a fast and sensitive infrared camera *K. Golasinski [1], E. Pieczyska [1], M. Maj [1], M. Staszczak [1], S. Kuramoto [2]* *[1] Polish Academy of Sciences, Warsaw, Poland; [2] Ibaraki University, Hitachi, Japan*
16:10	**Th.4.A.5** Applications and Latest Developments for Mobile Active Thermography Systems for the Non-Destructive Inspection of Composites *T. Kröger [1], C. Ferber [1]* *[1] AT – Automation Technology, Bad Oldesloe, Germany*	**Th.4.B.5** Experimental and numerical approach to identify major heating mechanism in induction thermography of carbon fiber reinforced plastic components *R.T. Kidangan [1], K. Chitti Venkata [1], K. Balasubramaniam [1]* *[1] Indian Institute of Technology Madras, Chennai, India*	**Th.4.C.5** Energetic approach to study the plastic behaviour in CT specimens *R. De Finis [1], D. Palumbo [1], U. Galietti [1]* *[1] Politecnico di Bari, Italy*
20:00	Conference Dinner at „Wasserwerk“, Entrance 19:30 h		

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▶	**Fr.1.A** **KEYNOTE IV** *J.-M. Buchlin*		
08:30	**Fr.1.A.1** Trends of IR-thermal imaging in medical diagnostics A. Nowakowski [1] [1] Gdansk University of Technology, Gdansk, Poland		
09:15	Break		
▶	**Fr.2.A** **PHOTOTHERMAL TECHNIQUE** *C. Meola*	**Fr.2.B** **MATERIAL PROPERTIES** *C. Pradere*	**Fr.2.C** **CIVIL ENGINEERING & BUILDINGS II** *R. Krankenhagen*
09:45	**Fr.2.A.1** Forakam: Imaging photothermal radiometry P. Menner [1], J. Koch [1], D. Saal [2], P. Mayr [2] [1] edevis GmbH, Stuttgart, Germany; [2] Institute for Laser Technology in Medicine and Measurement Technique (ILM), Ulm, Germany	**Fr.2.B.1** Taking into account heat losses in front-face pulse IR thermography experiment for thermal diffusivity identification D. Balageas [1], J.-M. Roche [2] [1] I2M, TREFLE, Talence, France; [2] ONERA, Châtillon, France	**Fr.2.C.1** Approach for external measurements of the heat transfer coefficient (U-value) of building envelope components using UAV based infrared thermography D. Patel [1], J. Estevam Schmiedt [2], M. Röger [3], B. Hoffschmidt [2] [1] Deutsches Zentrum für Luft- und Raumfahrt, Jülich, Germany; [2] Deutsches Zentrum für Luft- und Raumfahrt, Köln, Germany; [3] Deutsches Zentrum für Luft- und Raumfahrt, Almeria, Spain
10:05	**Fr.2.A.2** Two-dimensional interference of photothermally generated moving thermal waves E. Thiel [1], S. Ahmadi [1], M. Ziegler [1] [1] BAM, Berlin, Germany	**Fr.2.B.2** Thermal properties of electrically aligned CNF based fluid composites N.W. Pech-May [1], I.Y. Forero-Sandoval [2], F. Cervantes-Alvarez [2], J.J. Alvarado-Gil [2] [1] Universität Bayreuth, Germany; [2] CINVESTAV Unidad Mérida, Mexico	**Fr.2.C.2** Active thermographic inspection of external thermal insulation system with plastic anchors: evaluation of different thermal stimulus M. Gonçalves [1], N. Simões [1], C. Serra [1] [1] ADAI-LAETA, Coimbra, Portugal
10:25	**Fr.2.A.3** IR Thermography applied to assess thermophysical properties of doped polyaniline for thermoelectric applications P. Bison [1], S. Boldrini [2], A. Famengo [2], J. Morikawa [3], S. Rossi [1] [1] CNR-ITC, Padova, Italy; [2] CNR-ICMATE, Padova, Italy; [3] Tokyo Institute of Technology, Tokyo, Japan	**Fr.2.B.3** Thermal Effusivity Determination of Carbon Fibre Reinforced Polymers by means of Active Thermography J. Suchan [1], G. Hendorfer [1] [1] University of Applied Sciences Upper Austria, Wels, Austria	**Fr.2.C.3** Periodic thermal behavior of walls: an experimental approach G. Ferrarini [1], P. Bison [1], A. Bortolin [1], G. Cadelano [1], F. Peron [2] [1] CNR-ITC, Padova, Italy; [2] IUAV, Venezia, Italy
10:45	**Fr.2.A.4** Dual color thermographic technique applicability study at high temperature for Thermal Protection Systems (TPS) materials tested in Plasma Wind Tunnel (PWT) campaigns M. De Cesare [1], L. Savino [1], F. Di Carolo [2], A. Del Vecchio [1], U. Gallietti [2], D. Palumbo [2] [1] Italian Aerospace Research Centre, Capua, Italy; [2] Polytechnic University of Bari, Italy	**Fr.2.B.4** Use of Numerical Model and Nonlinear Regression in Determining Thermo-Material Properties of Thermal Barrier Coatings Using Flash Thermography L. Sripragash[1], M. Goldammer [2], M. Koerdel[1] [1] Siemens Inc., Charlotte, USA; [2] Siemens AG, Munich, Germany	**Fr.2.C.4** A novel experimental method for the in situ detection of thermal bridges in building envelopes based on active infrared thermography and singular value decomposition analysis R. Douguet [1], T.-T. Ha[1], V. Feuillet [2], J. Meulemans [1], L. Ibos [2] [1] Saint-Gobain Recherche, Aubervilliers, France; [2] Université Paris-Est Créteil, France
11:05	Break		

	Alexander 3	Grenander 1	Friedrich Wilhelm
▶	**Fr.3.A** **NDT IV** *J. Aderhold*	**Fr.3.B** **IMAGE AND DATA PROCESSING III** *S. Svaic*	**Fr.3.C** **CIVIL ENGINEERING & BUILDINGS III** *P. Bison*
11:30	**Fr.3.A.1** Rail inspection using active thermography to detect rolled-in material *R. Usamentiaga [1], S. Sfarra [2], J. Fleuret [3], B. Yousefi [3], D. Garcia [1]* *[1] University of Oviedo, Gijon, Spain; [2] University of L'Aquila, Italy; [3] Laval University, Quebec, Canada*	**Fr.3.B.1** Systematic errors in the evaluation of uncorrected data from thermographic lock-in measurements *R. Krankenhagen [2], M. Ziegler [2]* *[1] BAM, Berlin, Germany*	**Fr.3.C.1** Appreciation of the delay in the benefits of the thermal energy released by PCM in civil engineering structures *N. Le Touz [1,2], M. Marchetti [3,4], J. Dumoulin [1,2], L. Peiffer [3], A. Escal [3], L. Ibos [5], M. Fois [5], P. Bourson [4]* *[1] IFSTTAR, Bouguenais, France; [2] Inria, Rennes, France; [3] Cerema Est, Tomblaine, France; [4] Université de Lorraine, Metz, France; [5] Université Paris-Est Créteil, France*
11:50	**Fr.3.A.2** Non-Destructive Inspection System for Welding Processes by applying Data Fusion *K. Simmen [1], B. Buch [1], A. Breitbarth [1], G. Notni [1]* *[1] Technische Universität Ilmenau, Germany*	**Fr.3.B.2** Infrared modulated thermography based on the adaptive complex Morlet wavelet analysis *X. Guo [1], S. Zhao [1], Y. Liu [2]* *[1] Beihang University, Beijing, China; [2] AECC Beijing Institute of Aeronautical Materials, Beijing, China*	**Fr.3.C.2** Diffuse versus specular reflection: the influence of hot spots on reflected apparent temperature *L. Lauriks [1], I. Severins [1], J. Peeters [1], G. Steenackers [1]* *[1] Universiteit Antwerpen, Belgium*
12:10	**Fr.3.A.3** Active and passive thermography for defect detection in polymer joints *H. Leicht [1], M. Heilig [1], C. Pommer [1], E. Kraus [1], B. Baudrit [1]* *[1] SKZ – German Plastics Center, SKZ – KFE gGmbH, Würzburg, Germany*	**Fr.3.B.3** Closed Form, One-Dimensional Model of a Multilayer System Based on Thermographic Signal Reconstruction *M.F. Beemer [1], S. Shepard [1]* *[1] Thermal Wave Imaging, Inc., Ferndale, USA*	**Fr.3.C.3** Flat roof surface temperature assessment using IRT *N. Simões [1], C. Serra [1], I. Simões [1]* *[1] ITeCons, Coimbra, Portugal*
12:30		**Fr.3.B.4** Stitching Solution for optical and thermal images *J. Austen [1]* *[1] Composcan GmbH, Potsdam, Germany*	**Fr.3.C.4** Study of measurements bias due to environmental and spatial discretization in long term thermal monitoring of structures by infrared thermography *T. Toullier [1,2], J. Dumoulin [1,2], L. Mevel [1,2]* *[1] Ifsttar, Bouguenais, France; [2] Inria, Rennes, France*
13:00	Closing		

Biomedical Applications

P1* Study of the evolution of the mechanical properties of orthodontic arches by stimulated infrared thermography
N. Chahine[1], K. Mouhoubi[1], A. Diakhate[1], S. Harakeh[2], P. Millet[1], J.-L. Bodnar[1]
[1] University of Reims, France; [2] King Fahd Medical Research Center; King Abdulaziz University, Jeddah, Saudi Arabia

P2 The analysis of thermoregulatory processes in girls and boys in thermal imaging tests
A. Dębiec-Bąk[1], T. Kuligowski[1], A. Skrzek[1]
[1] University School of Physical Education in Wroclaw, Poland

P3 Thermal profile of broilers infected by Eimeria tenella
I. Knížková[1], P. Kunc[1], I. Langrová[2], J. Vadlejch[2], I. Jankovská[2]
[1] Institute of Animal Science, Prague, Czech Republic; [2] Czech University of Life Sciences Prague, Czech Republic

P4 Teat traumatization in conventional and automatic milking system
P. Kunc[1], I. Knížková[1], J. Hanusová[2]
[1] Institute of Animal Science, Prague, Czech Republic; [2] Slovak University of Agriculture in Nitra, Slovakia

P5 Development of a software algorithm working with infrared images and useful for the early detection of mastitis in dairy cows
M. Zaninelli[1], V. Redaelli[2], F. Luzi[2], V. Bronzo[2], A. Tapella[1], M. Mitchell[3], V. Dell'Orto[2], D. Cattaneo[2], G. Savoini[2]
[1] Università degli Studi, Milano, Italy; [2] Università Telematica San Raffaele Roma, Italy; [3] Scottland's Rural College, Midlofhian, UK

P6 Thermomechanical analysis of the surface vascular system – Application to the diabetic foot
V. Serantoni[1], F. Jourdan[1], H. Louche[1], A. Sultan[2]
[1] Université de Montpellier, France; [2] CHU Lapeyronie, Montpellier, France

P7 Application of passive infrared thermography for DIEP flap breast reconstruction
G. Steenackers[1,2], J. Peeters[1], P. Parizel[1,3], W. Tjalma[3]
[1] University of Antwerp, Belgium; [2] Vrije Universiteit Brussel, Belgium; [3] Antwerp University Hospital, Antwerp, Belgium

P8 Infrared thermography monitoring of the face skin temperature as indicator of the cognitive state of a person
A. Stoynova[1]
[1] Technical University of Sofia, Bulgaria

P9 Review of Inventions that Formed the Basis of the Original Method of Infrared Venography
A. Urakov[1], N. Urakova[1], A. Reshetnikov[1], M. Kopylov[1]
[1] Izhevsk State Medical Academy, Izhevsk, Russia

P10 Infrared Imaging Device for Measuring Living Objects in Total Darkness
A. Urakov[1], A. Kasatkin[1], O. Shikhova[2], V. Dement'ev[2]
[1] Izhevsk State Medical Academy, Izhevsk, Russia; [2] Kalashnikov Izhevsk State Technical University, Izhevsk, Russia

P11 Dynamic Infrared Mapping of Human Skin
M. Volovik[1], S. Polevaia[2]
[1] Volga Federal Medical Research Center, Ministry of Health of Russia, Nizhny Novgorod, Russia; [2] Nizhny Novgorod State Medical Academy, Nizhny Novgorod, Russia

P12 Dynamic Infrared Mapping of Exposed Human Cortex During Removal of Brain Tumors
M. Volovik[1], S. Polevaia[2], A. Sheludyakov[1], I. Medyanik[1]
[1] Volga Federal Medical Research Center, Ministry of Health of Russia, Nizhny Novgorod, Russia; [2] Nizhny Novgorod State Medical Academy, Nizhny Novgorod, Russia

P13 Thermography-based remote detection of psycho-emotional states
I. Znamenskaya[1], E. Koroteeva[1], A. Isaychev[1], A. Chernorizov[1]
[1] Lomonosov Moscow State University, Moscow, Russia

Calibration and Metrology

P14 Local estimation of thermal effusivity by stimulated infrared thermography
K. Mouhoubi[1], J.-L. Bodnar[1], J.-M. Vallet[2], V. Detalle[3]
[1] University of Reims, France; [2] Centre Interdisciplinaire de Conservation et Restauration du Patrimoine (CICRP), Marseille, France; [3] C2RMF, Paris, France

P15* SI traceable measurement of the spectral responsivity of thermal detectors in the wavelength range from 1.5 µm to 10.6 µm by using a cryogenic radiometer at PTB
P. Meindl[1], D. Taubert[1], U. Johannsen[1], T. Pohl[1], L. Werner[1], E. Kosubek[1]
[1] Physikalisch-Technische Bundesanstalt, Berlin, Germany

P16 Quantitative thermography of glass casting using characterised low cost short-wave Infrared Sensors
L. Stanger[1], J. Willmott[1], N. Boone[1], T. Wilkes[1], A. McGonigle[1]
[1] The University of Sheffield, United Kingdom

Electronics & Semiconductors

P17 The reduction of fringing effect loss in gapped ferrite inductors by changing the resistance and diameter of windings
R. Kasikowski[1], B. Wiecek[2]
[1] Stadium Stontronics Ltd, Norwich, United Kingdom; [2] Lodz University of Technology, Lodz, Poland

P18 High response multicolor quantum well and superlattice infrared photodetector with grating structure optimization
B.-W. Liang[1], C.-C. Huang[1], C. Nien[1], T. Yang[1], S.-P. Chao[1], B.-M. Chen[1], S.-H. Lin[1], C.-H. Kuan[1]
[1] National Taiwan University, Taipei, Taiwan (Republic of China)

P19* Infrared Micro Thermography of High-Power AlInGaN LEDs Using High Emissivity (black) Coating in IR and Transparent in the Visible Spectral Region
A. Zakgeim[1], A. Chernyakov[1], A. Aladov[1]
[1] Russian Academy of Sciences, Saint-Petersburg, Russia

Environment

P20* The continuous thermal imaging of the flood embankment to identify location of the leaks
B. Bukowska-Belniak[1], A. Borecka[1], A. Leśniak[1]
[1] AGH University of Science and Technology, Krakow, Poland

P21 Active Thermography to analyze the real-time Plants response to UV-B irradiation
M. Rippa[1], P. Mormile[1]
[1] Institute of Applied Sciences and Intelligent Systems – ISASI CNR, Pozzuoli, Italy

* Posters with Short Presentation (see page 9-10)

Image & Data Processing

P22* Infrared Diagnostic for Safe Plasma Operation at Wendelstein 7-X
A. Ali [1], M. Jakubowski [1], T. Sunn Pedersen [1], R. Neu [2], P. Drewelow [1], A. Puig Sitjes [1]
[1] Max Planck Institute for Plasma Physics, Greifswald, Germany; [2] Max Planck Institute for Plasma Physics, Garching, Germany

P23* Approaches for quantitative study of divertor heat loads on W7-X
Y. Gao [1], M. Jakubowksi[2], P. Drewelow[2], F. Pisano[3], A. Puig Sitjes[2], H. Niemann[2], A. Ali[2], M. Rack[1]
[1] Forschungszentrum Jülich, Germany; [2] Max-Planck-Institut für Plasmaphysik, Greifswald, Germany; [3] University of Cagliari, Italy

P24 Method of auto aggregation of infrared images for global quality improvement
M. Fidali [1], W. Jamrozik [1]
[1] Silesian University of Technology, Gliwice, Poland

P25 Thermographic assessment of thermal cycle influence in structure and properties of the 4430V steel
W. Jamrozik [1], M. Żuk [1], J. Górka [1]
[1] Silesian Univeristy of Technology, Gliwice, Poland

P26* Application of wavelets to improvement of defects visibility in active thermography
M. Kurpiński [1], M. Fidali [1]
[1] Silesian University of Technology, Gliwice, Poland

P27* Application of Deep Learning in Infrared Non-Destructive Testing
B. Yousefi [1], D. Kalhor [1], R. Usamentiaga [2], L. Lei [1], C. Ibarra- Castanedo [1], X. Maldague [1]
[1] Laval University, Quebec, Canada; [2] University of Oviedo, Gijón, Spain

Induction Thermography

P28* Subsurface Defect Evaluation in Additive Manufacturing Process using Pulsed Induction Thermography
O. Ghibaudo [1]
[1] SAFRAN SA, Châteaufort, France

Industrial Applications

P29 Investigation of Delamination in Thermal Barrier Coating by Pulsed Thermography
W. Kim [1], R. Shrestha [1], S. Myoung [2]
[1] Kongju National University, Cheonan, South Korea; [2] Corporate R&D Institute of Doosan Heavy Industry, Changwon, South Korea

P30 Monitoring process variations in paper and board production using IR technique
C. Östlund [1], P. Krochak [1], A. Tysén [1]
[1] RISE Bioeconomy, Stockholm, Sweden

P31* FeO content estimation in the steel slag using Raman spectroscopy in NIR range
I. Shatarah [1]
[1] Lodz University of Technology, Lodz, Poland

P32 A method for automatic gas detection using wide-band 3-14 µm bolometer camera
P. Wiecek [1]
[1] Lodz University of Technology, Lodz, Poland

P33 Monitoring of temperature variation in manufacturing process of centrifugally cast pipe using infrared thermography
H. Jung [1], S. Yi [1], Ki. Kim [2], Kyen. Kim [2], H. Choi [2], Kyeo. Kim [1]
[1] Chosun University, Gwangju, South Korea; [2] TMC Co., Ltd., Jeonbuk, South Korea

Modelling

P34 Thermal modelling and thermography measurements of thermoregulation effects in a skin tissue
M. Strakowska [1], M. Strzelecki [1], B. Wiecek [1]
[1] Lodz University of Technology, Lodz, Poland

Monitoring & Maintenance

P35* Comparison of MWIR thermography and high-speed NIR thermography in a laser metal deposition (LMD) process
S.J. Altenburg [1], C. Maierhofer [1], A. Straße [1], A. Gumenyuk [1]
[1] BAM, Berlin, Germany

P36* Application of thermal imaging system for prediction of fatigue crack initiation in Ti-6Al-4V fabricated by EBM
P. Koruba [1], M. Karoluk [1], G. Ziółkowski [1], E. Chlebus [1]
[1] Wroclaw University of Science and Technology, Wroclaw, Poland

P37 Thermographic diagnostics for detecting malfunctions in TV
A. Stoynova [1], B. Bonev [1]
[1] Technical University of Sofia, Bulgaria

NDT

P38* Comparison between multi-frequency and multi-speed laser lock-in thermography methods for the evaluation of crack depths in metal
C. Boué [1], S. Holé [1]
[1] Sorbonne Université, Paris, France

P39 Study of bronze repairs by finite element method (FEM) interpretation of the thermographic results
G. Caruso [1], F. Mercuri [2], S. Paoloni [2], N. Orazi [2], U. Zammit [2], C. Cicero [2], M. Ferretti [1], O. Colacicchi Alessandri [3]
[1] ITABC -CNR, Monterotondo St., Italy; [2] Università degli Studi di Roma Tor Vergata, Rome, Italy; [3] Museo Nazionale Romano-Palazzo Massimo, Rome, Italy

P40* Thermal Diffusivity Measurements With Flash Method at Different Depths In a Burned Composite Material
S.-O. Gnessougou [1], N. Poulin [1], C. Ibarra-Castanedo [1], A. de Champlain [1], X. Maldague [1], É. Robert[2]
[1] Université Laval, Québec, Canada; [2] Polytechnique Montréal, Canada

P41 Application of the Hill Climbing Algorithm to the Geometrical Reconstruction of Vertical Buried Heat Sources Using Vibrothermography
J. Jaime Puldón [1], A. Cifuentes Castro [1], K. Martínez [1], E. Marín Moares [1], J. Hernandez Wong [1], A. Mendioroz [2], A. Salazar [2]
[1] Instituto Politécnico Nacional, Centro de Investigación en Ciencia Avanzada y Tecnología Avanzada (CICATA), México City, Mexico; [2] Universidad del País Vasco, Bilbao, Spain

* Posters with Short Presentation (see page 9-10)

P42 Consideration of heating source for application of active thermography to concrete structure

M. Koyama [1], M. Ishikawa [2], H. Kasasno [3]
[1] Meisei University, Tokyo, Japan; [2] Tokushima University, Tokushima, Japan; [3] Nihon University, Fukushima, Japan

P43* Evaluation of water diffusion into wood material using Speckle pattern and active thermography

F. Madruga [1], S. Sfarra [2], J. Černecký [3], S. Perilli [2], E. Pivarčiová [3], J.M. López-Higuera [1]
[1] Universidad de Cantabria, Santander, Spain; [2] University of L'Aquila, Italy; [3] Technical University in Zvolen, Slovakia

P44* Active thermography using a dynamic excitation for NDT applied to large target

F.J. Madruga [1], A. Rodero [1], G. Fernández-Barreras [1], S. Sfarra [2], J.M. López-Higuera [1]
[1] Universidad de Cantabria, Santander, Spain; [2] University of L'Aquila, Italy

P45* Lock-in Thermography using High-Power Laser Sources

M. Ziegler [1], S. Ahmadi [1], E. Thiel [1]
[1] BAM, Berlin, Germany

P46 NDTonAIR: Training Network in Non-Destructive Testing and Structural Health Monitoring of Aircraft structures

H. Malekmohammadi [1], St. Laureti [1], M. Ricci [2], M. Wevers [3], G. Y. Tian [4], D. Premel [5], D. Hutchins [6], C. Glorieux [3], S. Dixon [6], P. Burrascano [1], P. Burgholzer [7], E. Jasiuniene [8], L. Mazeika [8], G. Berthiau [9], H. Pfeiffer [3], C. Reboud [5], J. Reynaert [10], B. Koehler [12], S. Soua [11], A. Angulo [11], S. Amato [6], A. Ba [9], H. Chebbi [5], S. Gartsev [12], Y. Kim [12], M. Khalid Rizwan [1], T. Seresini [3], M. Stamm [10], S. Sunetchiieva [3], J. Vyas [8], B. Yilmaz [8], S. Waters [7], Q. Yi [4], A. Zitoun [11], R. Kazys [8]
[1] BAM, Berlin, Germany; [2] University of Calabria, Rende, Italy; [3] KU Leuven, Belgium; [4] Newcastle University, Newcastle, United Kingdom; [5] CEA-LIST, Paris, France; [6] University of Warwick, Coventry, United Kingdom; [7] RECENDT GmbH, Linz, Austria; [8] Kauno Technologijos Universitetas, Kaunus, Lithuania; [9] Université de Nantes, France; [10] Brussels Airlines, Brussels, Belgium; [11] TWI Ltd., Cambridge, United Kingdom; [12] Fraunhofer IKTS, Dresden, Germany

NDT Applied to Composite Structures

P47 Vibro-thermography of debonding defects in composite plates based on viscoelasticity heat

X. Guo [1], L. Zhu [1]
[1] Beihang University, Beijing, China

P48 Active infrared thermography with forced cooling for composites evaluation

B. Grochowalska [1], T. Chady [1], K. Gorący [1]
[1] West Pomeranian University of Technology, Szczecin, Poland

Novel Techniques

P49 Photothermal pump-probe lock-in shadowgraph technique using a thermographic camera for thermal diffusivity measurement in thin metallic filaments

A. Cifuentes [1], E. Marin Moares [1], S. Alvarado [1], H. Cabrera [2], A. Calderon [1]
[1] Instituto Politécnico Nacional, Mexico City, Mexico; [2] The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy

P50 Potential contribution of the Infrared Industry in the future of IoT/IIoT

A. Rozlosnik [1]
[1] SI Termografia Infrarroja, Buenos Aires, Argentina

P51* Three-dimensional thermographic reconstruction of embedded heat sources by means of virtual waves

G. Stockner [1], G. Mayr [1], J. Gruber [1], P. Burgholzer [2], G. Hendorfer [1]
[1] University of Applied Sciences Upper Austria, Wels, Austria; [2] Research Center for Non Destructive Testing (RECENDT), Linz, Austria

Remote Sensing

P52* Modeling of Spontaneous Raman Scattering in silica light guides for Distributed Temperature Sensing

I.S.M. Shatarah [1], R. Olbrycht [1], B. Więcek [1]
[1] Lodz University of Technology, Lodz, Poland

Works of Art

P53 Early detection of micro-organisms development on stone monuments thanks to the stimulated infrared thermograph and SVD

S. Eyssautier-Chuine [1], K. Mouhoubi [1], F. Reffuveille [1], J.-L. Bodnar [1]
[1] University of Reims, France

* Posters with Short Presentation (see page 9-10)