

19th World Conference on Non-Destructive Testing

Berichtsband BB 158

Munich, Germany
13 - 17 June 2016

Volume 1 of 8

ISBN: 978-1-5108-6999-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

This work is licensed under a Creative Commons Attribution 3.0 International Licence. Licence details:
<http://creativecommons.org/licenses/by/3.0/>.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact Deutsche Gesellschaft Fuer Zerstoerungsfreie Pruefung (DGZfP)
at the address below.

Deutsche Gesellschaft Fuer Zerstoerungsfreie Pruefung (DGZfP)
Max-Planck-Str. 6
12489 Berlin
Germany

Phone: +49 30 67807-0
Fax: +49 30 67807-109

mail@dgzfp.de

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

New ISO Calibration Block for Phased Array Ultrasonic Testing	1
<i>D. Chauveau, E. Ginzel, E. Sjerve, P. Calmon, C. Bird, M. Moles</i>	
A Simplified Approach for DAC with Phased-Array.....	10
<i>Y. Oberdörfer</i>	
High Resolution Phased Array Imaging using the Total Focusing Method	15
<i>W. A. K. Deutsch, W. Roye, H. Rast, P. Benoit</i>	
Phased Array Technology - Scan Plan Methodologies for Weld Inspection.....	23
<i>T. Couturier</i>	
Nonlinear NDT: A Route to Conventional Ultrasonic Testing.....	24
<i>I. Solodov</i>	
Detecting the Fatigue Damage of Ropes Using the Nonlinear Acoustic Second Harmonic Parameter by the Magnetostrictive Guided Wave Method	32
<i>J. Xu, J. Zhou, Y. Sun, X. Wu</i>	
Anisotropy of NEWS Damage Parameters in CFRP Composite	40
<i>Z. Prevorovsky, J. Kober, D. Tokar, J. Krofta</i>	
Experimental and Numerical Analysis of the Nonlinear Interaction Between a Longitudinal Wave and Closed Crack.....	42
<i>A. Saidoun, A. Meziane, M. Rénier, C. Bacon, F. Zhang, H. Walaszek</i>	
X-ray Computed Tomography Reconstruction on Non-Standard Trajectories for Robotized Inspection.....	50
<i>H. Banjak, M. Costin, C. Vienne, V. Kaftandjian</i>	
Comparison of Reconstruction Methods for Computed Tomography with Industrial Robots using Automatic Object Position Recognition	58
<i>P. Klein, F. Herold</i>	
3D X-Ray High Energy Testing of Large Objects with Specialized Manipulation Trajectories.....	66
<i>B. Redmer, M. Tschaikner, S. Hohendorf, U. Ewert, A. Deresch, C. Bellon</i>	
Novel Handling Concept for Production-integrated Computed Tomography	67
<i>M. Eberhorn, S. Oeckl, T. Stocker, F. Brunner</i>	
NDT Reliability Assessment for Complex NDT Processes.....	74
<i>D. Forsyth</i>	
The Use of Simulation in POD Curves Estimation: An Overview of the IIW Best Practices Proposal.....	76
<i>P. Calmon, B. Chapuis, F. Jenson, E. Sjerve</i>	
An Overview of Standardized Capability for US Air Force Inspections	83
<i>E. A. Lindgren, J. Brausch</i>	
Analyzing the Reliability of Non-destructive Tests using the Modular Modell - A Practical Approach	91
<i>R. Holstein, C. Müller</i>	
State of the Art on Magnetic Properties – Stress Correlation in Steels.....	97
<i>E. Hristoforou, A. Ktena, P. Vourna, E. Mangiorou, S. Aggelopoulos, P. Švec, C. Hervoche</i>	
Analysis and Stress Determination in Welded Samples.....	107
<i>E. Hristoforou, A. Ktena, P. Vourna, E. Mangiorou, S. Aggelopoulos, P. Švec, C. Hervoche</i>	
Universality of the Calibration Curves - The Universality Law	114
<i>E. Hristoforou, A. Ktena, P. Vourna, E. Mangiorou, S. Aggelopoulos, P. Švec, C. Hervoche</i>	
Monitoring Magnetic Property Tensor Across the Weld at the Same Points where Stress Tensor was Monitored.....	121
<i>E. Hristoforou, A. Ktena, P. Vourna, E. Mangiorou, S. Aggelopoulos, P. Švec, C. Hervoche</i>	
A Quantum Well Hall Effect Magnetovision System for Non-Destructive Testing	129
<i>C.-W. Liang, E. Ahmad, E. Balaban, J. Sexton, M. Missoos</i>	
Coplanar Capacitive Imaging Probe with Electrode Array for Hidden Defect in Non-conducting Materials.....	137
<i>X. Yin, Z. Li, A. Yan, W. Li, X. Li, G. Chen</i>	
Introduction of The Field Kelvin Probe - Non-Contact and Through-Wall Detection of Corrosion	139
<i>E. F. Turcu, S. Evers, B. Henriksen, I. Klepsvik, M. Rohwerder</i>	
Novel Air-coupled Ultrasonic Transducer Combining the Thermoacoustic with the Piezoelectric Effect	141
<i>M. Gaal, M. Daszewski, J. Bartusch, F. Schadow, E. Dohse, M. Kreutzbruck, M. Weise, U. Beck</i>	
In-line Characterisation of Microstructure and Mechanical Properties in the Manufacturing of Steel Strip for the Purpose of Product Uniformity Control	147
<i>F. Van Den Berg, P. Kok, H. Yang, M. Aarnts, J.-J. Vink, W. Beugeling, P. Meilland, T. Kebe, M. Stolzenberg, D. Krix, A. Peyton, W. Zhu, A. Martinez-De-Guerenu, I. Gutierrez, D. Jorge-Badiola, K. Gurruchaga, P. Lundin, A. Volker, M. Mota, J. Montero, H. Wirdelius, C. Moccia, G. Nastasi, V. Colla, C. Davis, L. Zhou, R. Schmidt, S. Labbé, C. Reboud, A. Skarlatos, T. Svaton, V. Leconte, P. Lombard</i>	
Ultrasonic Velocity and Attenuation Measurements in L80 Steel and their Correlation with Tensile Properties	157
<i>J. B. Wiskel, J. Kennedy, D. G. Ivey, H. Henein</i>	
Speed Effect on a Multi-frequency Electromagnetic NDT System Used for the Characterisation of the Microstructure of Strip Steel	166
<i>W. Zhu, A. Peyton, F. Van Den Berg, H. Yang, C. Commandeur</i>	
In-line Quantitative Measurement of Transformed Phase Fraction by EM Sensors during Controlled Cooling on the Run-out Table of a Hot Strip Mill.....	174
<i>H. Yang, F. Van Den Berg, A. Luinenburg, C. Bos, G. Kuiper, J. Mosk, P. Hunt, M. Dolby, M. Fliccos, A. Peyton, C. Davis</i>	

A Theory of Nonlinear Eddy Current NDE Model and its Experimental Tests	182
<i>N. Nakagawa</i>	
Fractal Technique for the Extraction of Latent Safety Information from Multi Sensors Monitoring Data	190
<i>V. V. Vengrinovich, V. Lykov</i>	
Higher-order Scattering for Diffuse Ultrasonic Backscatter Measurements on Nickel Alloys	198
<i>P. Hu, N. Matz, S. Dugan, S. Wagner, J. Turner</i>	
Simulation Model of Eddy Current Inspection with DC Magnetic Field Associated	200
<i>J. V. Rocha, C. Camerini, J. Rebello, G. Pereira</i>	
Guided Wave Testing for Structural Component by Multipoint Sensing with Wireless Accelerometers	202
<i>K. Nakahata, T. Takamoto, N. Saitoh</i>	
Pulse-Echo Guided Wave Inspection Using Multimode Dispersion Compensation	209
<i>R. Roberts</i>	
Application of Ultrasonic Guided Waves for Inspection of Multi-Wire Rope Structures	217
<i>R. Raisutis, R. Kazys, L. Mazeika, E. Zukauskas, V. Samaitis, A. Jankauskas</i>	
Sizing of Through-Thickness Circular Holes in Plate Structures by Ultrasonic Lamb Wave Testing	219
<i>F. Honarvar, A. Sedaghati, A. Sinclair</i>	
Study of Ultrasonic Phased-Array Methods for the Inspection of Composite Structures with Different Geometric and Mechanical Properties	228
<i>A. Aschy, N. Terrien, S. Robert, M. Bentahar</i>	
What is the Benefit of Total Focusing Method and Full Matrix Capture for Ultrasonic Imaging Using Phased Array Technique?	230
<i>R. Boehm, H.-J. Montag, D. Brackrock, T. Heckel</i>	
Progress in the Development of a FMC/TFM Based Ultrasonic System	232
<i>R. Ten Grootenhuis, A. Hong, Y. Verma</i>	
Research on Correction and Optimization of Post-processing Imaging of Structure with Non-planar Interface Using Full Matrix Data of Ultrasonic Array	241
<i>Z. Zhou, Y. Li, W. Zhou</i>	
The Material Elastic Constant Evaluation by Ultrasonic Acoustics Nonlinearity and Wave Velocity	249
<i>J. Choi, Y. Cho, Y. Lee</i>	
Characterization of Microstructural Evolution in Heat Treated Rolled Copper and Brass by Nonlinear Ultrasonic Waves	250
<i>W. Li, Z. Shi, X. Liu, C. Xu, Y. Cho</i>	
Optimized Analysis for Nonlinear Ultrasonic Imaging in Complex Media : Acoustic Imaging for Cultural Heritage	251
<i>S. Dos Santos, N. Poirat</i>	
Acoustic Resonance Testing for Nondestructive Detection of Forged Or Casted Serial Parts with Intolerable Geometric Variations – Experimental Model Adaption	259
<i>M. Heinrich, U. Rabe, B. Grabowski, B. Valeske</i>	
A New Method to Test Masonry Shear Characteristics Thought Flat Jack (FJ-SCT Method)	261
<i>D. Foppoli, A. Pulcini</i>	
Characterisation of Historic Facades using Active Thermography with Solar Heating and Optical Methods	270
<i>C. Maierhofer, M. Röllig, H. Steinfurth, S. Augustin, R. Mecke, M. Schiller, A. Kernchen, U. Kalisch, J. Meinhardt, C. Hennen, E. T. Groll, T. Arnold</i>	
Moisture Monitoring During an Artificial Weathering Test of a Cultural Heritage Compatible Insulation Plaster	278
<i>J. Frick, M. Reichert, F. Lehmann, M. Stegmaier, K. Herter</i>	
Development of a Standard for Computed Tomography of Historical Musical Instruments – The MUSICES Project	285
<i>T. Fuchs, R. Wagner, C. Kretzer, R. Schielein, G. Scholz, M. Zepf, F. Bär, S. Kirsch, M. Wolters-Rosbach</i>	
Simulation of the Probability of Detection of a Longitudinal Flaw within a Pipe Using an Automated Ultrasonic Inspection	293
<i>O. Lazzari, F. Deneuville, S. Petit</i>	
Automated Data Analysis (ADA) of Ultrasonic NDE Data for Composites	301
<i>J. Welter, J. Aldrin, D. Forsyth</i>	
Corrosion Inspection with Dual Element Phased Arrays	311
<i>Y. Oberdörfer, T. Jenkins</i>	
Detection of Hydrothermal Aging in Cured-In-Place Pipes (CIPP) Based on Microwave System	312
<i>M. Manavipour, C. Sklarczyk, K. Szielasko, J. H. Kurz, C. Boller</i>	
A Modelling Approach for Guided Wave Propagation in Coated and Buried Pipes	319
<i>W. Duan, A. Dhutti, A. Mohimi, P. Mudge, C. Selcuk, T.-H. Gan</i>	
Guided Wave Attenuation in Coated Pipes Buried in Sand	327
<i>E. Leinov, M. Lowe, P. Cawley</i>	
Condition Detection in Underground Pipes with Airborne Acoustic Waves	N/A
<i>M. Ali, R. Long, K. Horoshenkov, S. Tait</i>	
Digital Image Processing for the Automation of NDT by Means of Endoscopy	328
<i>K. Spinnler, T. Bergen, J. Sandvoss, T. Wittenberg</i>	
Automatic Industrial CT Image Processing and Analysis of Batch Workpiece NDT Based on the VGStudio SDK	336
<i>Y. Xiao, T. Wang, X. Zeng</i>	
Improvements to Image Processing Algorithms Used for Delamination Damage Extraction and Modeling	344
<i>M. Stefanik, K. Dragan</i>	
Phased Array UT Open Platform Electronics with Full-Matrix Capture for Custom and Automated Solutions	352
<i>G. Dao, R. Lallement</i>	

Examination of Service Life of Generator Rotor Retaining Rings Made of Astm A289 Class C Steel Using LDC1000 Sensor	353
<i>Z. H. Zurek, G. Dobmann, D. Baron</i>	
Efficient Inspection from Measurement Collection Through to Report	365
<i>W. Woodhead, N. Pearson, S. Marshall, M. Boat</i>	
Ultrasonic Inspection of Fatigue Stressed Areas of Hydroelectric Power Plant Components	377
<i>S. Dugan, S. Berner, J. Kropf, R. Müller, J.-P. Hoffmann</i>	
Ultrasonic Waveguide Techniques for Distributed Temperature Sensing	384
<i>S. Periyannan, P. Rajagopal, K. Balasubramaniam</i>	
Eddy Current and Thermal Propagation for Quantitative NDT&E.....	392
<i>Y. Wang, G. Y. Tian, B. Gao</i>	
Sonothermography in Composite Materials: Finite Element Modeling and Experimental Validation	401
<i>A. Meziane, C. Bacon, C. Pradere, C. Biateau</i>	
Machine Vision Platform for Non-destructive Testing Methods of Fibre Reinforced Plastics	402
<i>I. Effenberger, T. Felix, A. Frommknecht, S. Fulga, A. Springhoff</i>	
Non-Destructive Evaluation of Defective CFRP Laminates	411
<i>T. Ullmann, T. Schmidt, D. Niebel</i>	
A New Generation of Frequency Steerable Transducers for Lamb Waves Inspections	413
<i>L. De Marchi, N. Testoni, A. Marzani</i>	
Non-Destructive Method Based on Rayleigh-Like Waves to Detect Corrosion Thinning on Non-Accessible Areas.....	421
<i>L. Taupin, F. Jenson, S. Murgier, P.-E. Lhuillier</i>	
An Analytical Insight into Contact Acoustic Nonlinearity of Guided Ultrasonic Waves induced by A “Breathing” Crack.....	430
<i>K. Wang, Z. Su</i>	
Methods for Quantitative Wall Thickness Mapping using Dispersive Guided Waves.....	439
<i>A. Volker, T. Van Zon</i>	
On Non-Maximizable Ultrasonic Responses and POD Curves	446
<i>M. Carbone, S. Cantini</i>	
Magneto-inductive Diagnosis of Steel Parts with Unknown Fatigue Load History	454
<i>G. Dobmann, Z. H. Zurek</i>	
Handheld Solution for Measurement of Residual Stresses on Railway Wheels using EMATs	463
<i>J. A. Jimenez Garrido, V. Garcia, C. Boyero</i>	
Inspection Forged Railway Wheels with Non-Destructive Testing Magnetic Barkhausen Noise to Evaluate Residual Stresses of Manufacturing	471
<i>É. Santos, D. Minicucci, R. Barbosa, L. Padovese</i>	
Volumetric Digital Image Correlation for Materials Characterization	472
<i>E. Quintana, P. Reu, E. Jimenez, K. Thompson, S. Kramer</i>	
Determination of Particle Size Distribution of Polymer- Polymer Composite Material Using X-ray CT	482
<i>D. Salabergen, R. Illek, M. Hering, J. Kastner, C. Hannesschläger</i>	
X-ray Computed Tomography of Structural Parts Made by Injection Moulding and a Local Reinforcement with Thermoplastic UD-Sheets	484
<i>A. Geyer, T. Wagner, M. Krumm, V. Hämmeler, R. Schlümpfer, C. Sauerwein</i>	
In Situ Micro Tomography and Radioscopy for Biology and Materials Characterization	495
<i>S. Zabler, A. Hörling, S. Gerth, N. Uhlmann, A. Rack, J. Hiller, W. Wiest, J. Dittmann, A. Tissen, R. Hanke, T. Fuchs</i>	
Accurate Ultrasonic Stress Measurement in Already Tightened Bolts by Means of Optimized Emat	497
<i>H. Walaszek, P. Bouteille, B. Clausse, A. Lhemery, F. Zhang</i>	
Stress Distributions Generated by Straightening of Steel Pipes	505
<i>M. Kaack, T. Orth, P. Staron, N. Schell, A. Schreyer, K. Theis-Bröhl, S. Raatz</i>	
Non-Destructive Determination of Residual Stresses in the Spiral Submerged Arc Welded Steel Pipes	512
<i>T. Kaleli, C. H. Gür</i>	
Ultrasonic Measurement of Residual Stresses in Welded Elements and Structures	518
<i>Y. Kudryavtsev, J. Kleiman</i>	
Observations on Implementation of the BAM Holistic Reliability Model	528
<i>G. Selby</i>	
Phased Array Ultrasonic Testing of Welds in Small Bore Tubing - Review of NDT Round-robin carried out by GENSIPI Consortium of UK Power Generating Companies	529
<i>C. Brett, P. Crowther</i>	
Validation of an Ultrasonic-Phased-Array-Method for Testing of Circumferential Welds at Thin-walled Pipes.....	531
<i>S. Hillmann, F. Schubert, D. M. Brosius, Z. Bor</i>	
Smart Data Analysis of the Results of Automated and Manual Ultrasonic Inspections on the Example of Rotor Forgings	539
<i>J. Vrana, K. Kadau, C. Amann, A. Klemm</i>	
Sonic and Ultrasonic Measurement Applications for Cased Oil Wells	540
<i>S. Zeroug, S. Bose, B. Sinha, M. Skataric, Y. Liu, R. D'Angelo</i>	
Detecting Bolt Loosening on the Basis of Vibration Signals as Low as a Few Hertz.....	552
<i>N. Yusa, S. Sawada</i>	
In-service Detection of Longitudinal Cracks on Drill Pipe using Induced Circumferential Current	554
<i>X. Yuan, W. Li, X. Yin, G. Chen, J. Ge</i>	
Evaluation of Bolt Loosening Using A Hybrid Approach Based on Contact Acoustic Nonlinearity.....	563
<i>Z. Zhang, Z. Su, Y. Xiao, M. Liu</i>	

Acoustic Monitoring of Proton Impacts at CERNs Large Hadron Collider	572
<i>B. Fischer, D. Deboy, S. Zötter</i>	
Magnetic Characterization of Wear Due to Fatigue and Inspection of Flaws in Small Diameter Wire Ropes.....	574
<i>A. Martinez-De-Guerenu, M. X. Zambrano, F. Arizti</i>	
Detecting and Quantifying High Temperature Hydrogen Attack (HTHA).....	582
<i>N. Trimborn</i>	
Nonlinear Ultrasonic Technique for Quantitative Evaluation of Strength Degradation	586
<i>J. Kim, D.-G. Song, J.-H. Lee, K.-Y. Jhang</i>	
Thickness Measurement of Multilayer Coating using Terahertz Techniques.....	588
<i>J. Jonuscheit, J. Klier, S. Krimi, G. Von Freymann</i>	
Modeling of TE Mode Transducer for Nondestructive Testing of Defects Inside a Metal Pipe Using Microwaves.....	590
<i>K. Sasaki, T. Katagiri, N. Yusa, H. Hashizume</i>	
3D Terahertz Imaging of High Temperature Lightweight Materials	592
<i>S. Becker, A. Keil, J.-M. Hausherr, A. Konschak</i>	
Terahertz Spectrum of Energetic Mixed Crystals, Phase-Transition Crystals and Co-Crystals.....	594
<i>Y. Du, W.-B. Zhang, H. Zong, J. Li</i>	
Modeling and Simulation of Ultrasonic Testing – A Practical Guide by the Sub-Committee, Modeling and Imaging’ within the DGZfP Committee of Experts on UT	605
<i>M. Spies</i>	
Elastic Wave Propagation in Polycrystalline Materials using Ray Tracing Model	608
<i>S. B. Shivaprasad, A. Saini, P. Purushothaman, K. Balasubramaniam, C. V. Krishnamurthy</i>	
Simulation of Ultrasonic Wave Propagation in Anisotropic Heterogeneous Welds embedded in a Polycrystalline Base Material	615
<i>F. Schubert</i>	
UT Simulation of Embedded Parametric Defects Using a Hybrid Model Based Upon Spectral Finite Element and Domain Decomposition Methods	616
<i>A. Imperiale, S. Chatillon, P. Calmon, N. Leymarie, S. Imperiale, E. Demaldent</i>	
Realistic Approaches for Achieving NDE-based Characterization in Complex Materials/Structures.....	622
<i>E. A. Lindgren</i>	
Inspection of the Aluminium Alloys Degradation in Aging Aircraft Components Based on Eddy Current Method Application	623
<i>V. Uchannin, O. Ostash, J. Golovatiuk, O. Semenets, L. Kovalchuk, G. Lutsenko, A. Opanasenko</i>	
Development of CFRP Aircraft Doors with the Interaction of NDT and Strength Analysis.....	633
<i>P. Schmiedel, M. Holzheimer</i>	
Structural Health Monitoring of Compressor and Turbine Blades with the Use of Variable Reluctance Sensor and Tip Timing Method	637
<i>M. Wachlaczko, M. Witos</i>	
Study of Railway Axle Ultrasonic Testing Technology and Ability Improvement	645
<i>C. Peng, X. Gao, Y. Zhang, J. Peng, A. Wang, B. Zhao, Y. Yang</i>	
Advances in Ultrasonic Inspection of High Speed and High Integrity Rail Wheels	652
<i>A. Desai</i>	

VOLUME 2

Near-Service Ultrasonic Testing of Solid Axles on Vehicles with Corrosive Load and its Technical Implementation - An Abstract of Precommissioning Inspection at DB Schenker Rail	660
<i>S. Bethke, J. H. Kurz</i>	
RAWIS: The Next Generation of Automated Inspection Systems for Railway Wheels.....	667
<i>A. Knam, T. Schwender, W. Kappes, R. Baumgarten</i>	
Increasing the Sensitivity of Ultrasonic Phased Array Wheel Set Axle Inspection by Using Signal Processing	675
<i>T. Heckel, R. Boehm, W. Spruch, S. Jacob</i>	
A New Approach on Dual-energy DR using Time-Delay-and-Integration Sensor	677
<i>N. Luu, J. Yang, C. Wang</i>	
Development and Applications of High Energy Industrial Computed Tomography In China.....	678
<i>Y. Xiao, Z. Chen, Y. Li, L. Ye</i>	
Non-Destructive Evaluation Utilizing Imaging Plates for Field Radiography Applications	686
<i>B. White</i>	
Improved Safety & Security of Gamma-Radiography in Germany.....	693
<i>T. Schmidbauer, M. Spieß</i>	
Photon Counting and Energy Discriminating X-Ray Detectors - Benefits and Applications.....	694
<i>D. Walter, U. Zscherpel, U. Ewert</i>	
Nondestructive Monitoring of the Variations in Microstructure and Residual Stress in the Carburized Steels	704
<i>H. Hızlı, K. Davut, C. Simsir, C. H. Gür</i>	
Advance in Stress Measurement via Barkhausen Noise	712
<i>V. V. Vengrinovich, D. Vintov, A. Prudnikov, P. Podugolnikov, V. Ryabtsev</i>	
Nondestructive Characterization of Ageing Phenomena in Heat Resistant Steels by Means of Micromagnetic Techniques	719
<i>M. Rabung, M. Kopp, R. Tschuncky, B. Kuhn, T. Uchimoto</i>	

Investigation of Magnetic Barkhausen Noise and Dynamic Domain Wall Behavior for Stress Measurement	729
<i>Y. Gao, G. Y. Tian, F. Qiu, P. Wang, W. Ren, B. Gao</i>	
Development of the Cable Tension Testing Instrument Based on the Permanent Magnetizer	736
<i>X. Wu, D. Deng</i>	
Eddy-Current Ply Lay-up Determination in Carbon-Fibre Reinforced Polymers (CFRP)	744
<i>R. Smith, R. Hughes, B. Drinkwater</i>	
Effect of Data Amount on Probability of Detection Estimation: Application to Eddy Current Testing	745
<i>T. Goursolle, T. Fauret, E. Juliac</i>	
Consideration of NDT Results Ambiguity While Estimating Rope Residual Strength by an Example of Drilling Rig Rope Monitoring System	753
<i>D. Slesarev, A. Vorontsov</i>	
Calibration of Pulsed Eddy Current Detection of Cracks Using Robust Statistics	761
<i>P. R. Underhill, D. Butt, T. W. Krause</i>	
Pulsed Eddy Current Detection of Second Layer Cracks at Ferrous Fasteners in Aircraft Lap-Joint Structures	768
<i>D. Butt, P. R. Underhill, T. W. Krause</i>	
Measurement of Acoustic Emission Source Location Accuracy loss of Concrete under Bending	776
<i>E. Tsangouri, G. Karaikos, D. G. Aggelis, A. Deraemaeker, D. Van Hemelrijck</i>	
Novel Spectral Kurtosis Technology for Adaptive Vibration Condition Monitoring of Multi Stage Gearboxes	784
<i>L. Gelman, H. Chandra, R. Kurosz</i>	
In Situ Thermography of Crack Growth in Sandwich Shell Segments with Manufactured Imperfections	785
<i>D. Nielow, V. Trappe</i>	
Requalification of LPG Tanks in Europe: Verifying the Structural Integrity by Monitoring the Pressure Test with Acoustic Emission	787
<i>G. Lackner, P. Tscheliesnig</i>	
Rotating Machine Diagnosis using Smart Feature Selection under Non-Stationary Operating Conditions	795
<i>P. S. Heyns, R. Vinson, T. Heyns</i>	
Examination of Service Life of Power System Components Made of P91 Steel (X10CrMoVNb9-1) Using Impedance Spectroscopy and Magnetic Resonance Technique	805
<i>Z. H. Zurek, G. Dobmann, B. Rockstroh, D. Kukla</i>	
Novel Ultrasonic NDT Technique for Early Detection of Creep Damage in Welded Steel Pipes	814
<i>L. Mazeika, A. Jankauskas, C. Nageswaran</i>	
Evaluation of the Fatigue State of Equipment from Austenitic Stainless Steels According to the Degree of Acquired Ferromagnetism and Accumulated Microdamages by Nondestructive Method to Measure the Magnetic Characteristic, the Coercive Force	816
<i>G. Bezlyudko, V. Nehotyashy, A. Palienko, R. Solomakha, A. Gopkalo</i>	
Fatigue Detection of Steel Plate Using Magnetic Flux Leakage Method	819
<i>K. Sakai, T. Kiwa, K. Tsukada</i>	
Coercivity of Metal as a Measure of its Damage at Micro Level in Assessing Fatigue, as well as in Problems of Restoration of Mechanical Properties	826
<i>K. Vakulenko, I. Kazak, G. Bezlyudko, R. Solomakha</i>	
Focusing Air-Coupled Ultrasonic Transducers Based on Ferroelectrets	829
<i>F. Schadow, M. Gaal, J. Bartusch, E. Dohse, E. Köppé</i>	
Non-destructive Testing of Future Rocket Boosters Using Air-Coupled Ultrasound	837
<i>A. Huber</i>	
Development of Air-Coupled Ultrasonic Transducers based on PMN-PT Type Single Crystals	846
<i>R. Kazys, R. Sliteris, J. Sestoka</i>	
Air-Coupled Ultrasonic Inspection Technique as NDT Tool for Evaluation of Porous Wound Oxide/Oxide Composite Ceramics	848
<i>V. Vasechko, M. Schmücker, N. Rahner, T. Ullmann</i>	
New Developments for Air-coupled Ultrasonic Techniques	857
<i>W. Hillger, L. Bühlung, D. Ilse</i>	
Imaging Beyond Aliasing	866
<i>A. Volker, P. Van Neer</i>	
Magnetic NDT for Steel Microstructure Characterisation – Modelling the Effect of Ferrite Grain Size on Magnetic Properties	875
<i>L. Zhou, C. Davis, P. Kok, F. Van Den Berg, S. Labbé, A. Martinez-De-Guerenu, D. Jorge-Badiola, I. Gutierrez</i>	
Acoustoelasticity of Polycrystalline Materials; A Formalism Based on the Self-consistent Elastic Constants	884
<i>C. Kube, A. Arguelles, J. Turner</i>	
3D Modeling and Experimental Validation of Flaw Responses Provided by Magnetic Flux Leakage NDT System Inspecting Ferromagnetic Pipes	886
<i>G. Wolf, F. Deneuville, E. Demaldent, C. Reboud, S. Barrez, A. Trillon</i>	
Purity Characterisation of Aluminium Melts by Ultrasonic Scattering Measurements: First Tests on a Model Suspension	896
<i>M. Weikert-Müller, T. Waschkies</i>	
Dynamic and Static Determinations for Anisotropic Material Constants of Additive Manufacture in Nondestructive Testing	898
<i>Y.-H. Huang, T.-R. Huang</i>	
Animated View for Detection of Hairline Fracture of the Cooling Hole of a Tornado Jet Turbine Blade by a CAD Based on the De-Convolution Technique	906
<i>K.-M. Chui, S.-Y. Zhang, E. Lehmann, A. Kaestner, S.-L. Chui, D. Stanfield, A. Wride</i>	

Development of Leakage Control Technology of Unclosed Constructions in Aviation.....	913
<i>M. Kazakevych, O. Semenets, V. Derecha, V. Kazakevych</i>	
NDT Standards for Additive Manufacture - A Review of Progress	920
<i>B. Dutton, M. Rosli, J. Waller, S. James, P. Woolliams</i>	
Smart NDT Tools: Connection and Automation for Efficient and Reliable NDT Operations.....	921
<i>F. Guibert, M. Rafrafi, D. Rodat, E. Prothon, N. Dominguez, S. Rolet</i>	
Optimized Semi-Flexible Matrix Array Probes for Large Rotor Shafts and DGS Sizing Diagram Simulation Tool	931
<i>D. Devos, G. Maes, P. Tremblay</i>	
FAAST Very Fast Phased Array System.....	940
<i>X. Harrich, P. Coperet</i>	
Scalability and Advanced Inspection Methods in Ultrasonic Phased Array Instrumentation.....	948
<i>E. Grondin, N. Badeau</i>	
Comparison of Ultrasonic Phased Array Probes Based on PMN-PT and PZT 1-3 Composites.....	957
<i>S. Walter, T. Herzog, F. Schubert, H. Heuer</i>	
Check Valve Diagnosis by Sectorial Scanning Phased Array Ultrasonic Technique	964
<i>H. M. Calas Del Castillo, B. De La Fuente, V. Barcenilla, P. I. Resa López, F. J. Fernández Muñoz</i>	
Advances in 3D Video Borescope Measurement Technologies for Defect Characterization in Power Generation.....	974
<i>T. Ward</i>	
A Portable Magnetic Flux Leakage Testing System for Industrial Pipelines Based on Circumferential Magnetization.....	975
<i>K. Zhao, X. Wu, G. Shen</i>	
Acousto-Optic Module for Combined Remote Visual and Spectral Endoscopic Inspection	983
<i>A. Machikhin, V. Kaloshin, A. Perfilov, V. Batshev, V. Kvak</i>	
The Use of Permanent Magnets for Magnetic Particle Inspection	989
<i>K. Cain, M. Purcell</i>	
Monitoring of Fatigue and Stress-Strain State of Structures and Equipment with New Magnetic Transducer	997
<i>V. Zakharov, G. Bezlyudko, R. Solomakha, A. Aman</i>	
Nondestructive Micromagnetic Materials Characterization at High Measuring Speed by Means of a Variant of 3MA Approach - 3MA-X8.....	1001
<i>R. Tschuncky, K. Szielasko, S. Youssef</i>	
Ultrasonic Nondestructive Testing and Regulation Technology of Residual Stress	1003
<i>C. Xu, J. Song, W. Song, J. Wang, H. Tian</i>	
Image Reconstruction of Corrosion under Coating Film by Dynamic Shear Strain Analysis of Lamb Waves.....	1012
<i>K. Teramoto, R. Md. Sanaul</i>	
Neutron Diffraction: The Forgotten Non-destructive Technique for Residual Stress Analysis ... and More	1020
<i>G. Bruno, A. Kromm, S. Cabeza, R. Stegemann, V. Lyamkin, M. Boin</i>	
Determination of Preload in Bolts by Ultrasound Without Referencing in Unloaded State	1021
<i>M. Becker, N. Groß, H.-R. Herzer</i>	
An Innovative Pipe End Inspection System and POD Analysis of its Capability	1028
<i>T. Schmitte, W. Weingarten, N. Chichkov, T. Orth, T. Kersting, M. Wadas, M. Spies</i>	
Ultrasonic Sol-Gel Arrays for Monitoring High-Temperature Corrosion	1029
<i>T. J. Eason, L. J. Bond, M. G. Lozev</i>	
Integration of Guided Wave Testing (GWT) with Risk Based Inspection (RBI).....	1038
<i>M. Evans, T. K. Vogt</i>	
Comparison PA and TOFD Vs. Radiography: New Technologies Lead to a More Efficient Approach.....	1039
<i>N. Trimborn</i>	
Reliability Analysis of the Ultrasonic Inspection System for the Inspection of Hollow Railway Axles.....	1046
<i>M. Pavlovic, C. Müller, T. Heckel, A. Zoëga</i>	
Space Terahertz Instrumentation for Integrity Inspection of Non-conducting Composites	1054
<i>A. Belitskaya, A. Baryshev, A. Khudchenko</i>	
A Discussion on the Accuracy of Vold-Kalman Filter Order Tracking for Rotating Machinery Condition Monitoring.....	1060
<i>K. Feng, K. Wang</i>	
Universal Single Sensor for Machinery Condition Monitoring: Vibration, Bearing Health and Temperature	1061
<i>G. Zusman</i>	
Damage Reconstruction in Complex Composite Structures using Lamb Waves.....	1066
<i>F. Raddatz, P. Wierach, M. Sinapius</i>	
Novel Signal Processing for Condition Monitoring and NDT: Present and Future	1075
<i>L. Gelman</i>	
On-Wing Gas-Turbine-Inspection and -Maintenance (Water Jet Cleaning of Inner Surfaces)	1076
<i>R. Weger</i>	
Pipe Robots for Internal Inspection, Non-Destructive Testing and Machining of Pipelines.....	1078
<i>A. Reiss</i>	
A View from All Perspectives.....	1086
<i>F. Eder, F. Stark, R. Söhnchen</i>	
Robotic Inspection Solutions for Petrochemical Pressure Vessels, Developed and Tested in the PETROBOT Project.....	1088
<i>B. Van Den Bos, J. Strand, A. Mallion, M. Oetiker, A. Schler, T. Black, P. Potnis</i>	
Customer-specific Inspection Services and Inspection Systems Using Innovative Tailor-made Hard- and Software	1098
<i>F. Wolfsgruber, R. Reimann, B. Gohlke</i>	

Fracture Properties of 2D Solids: Graphene, Boronitrene and MoS₂	1100
<i>P. Hess</i>	
Talbot-Lau Interferometry with a Non-Binary Phase Grating for Non-destructive Testing	1102
<i>Y. Shashev, A. Kupsch, A. Lange, R. Britzke, G. Bruno, B. R. Müller, M. P. Hentschel</i>	
Comparison Between Traditional Non-Destructive Techniques and Phase Contrast X-Ray Imaging applied to Aeronautical Carbon Fibre Reinforced Polymer	1111
<i>M. Gresil, V. Revol, S. Consuelo Garcea, R. Chemama, G. Kanderakis, K. Kitsianos, I. Koulalis, M.-O. Sauer, H. Trétout, A.-M. Madrigal</i>	
Structural Characterization by Raman Spectroscopy	1119
<i>D. Kovalenko, J. Opitz</i>	
Non-destructive, Non-contact Evaluation of Electrical Parameters of Silicon Solar Cells Using Photocarrier Radiometry and Camera Based High-frequency Lock-in Carrierography (LIC) Imaging	1121
<i>A. Mandelis, A. Melnikov</i>	
Multi-Dimensional Optimisation Inversion Methods Applied to the Ultrasound Response of Composites for 3D Profiling of Porosity	1122
<i>R. Tayong Boumda, R. Smith</i>	
The Quantitative Study of TOFD Influenced by the Frequency Window of Autoregressive Spectral Extrapolation	1124
<i>D. Kang, S. Jin, K. Zhang, Z. Luo, S. Zhang, L. Liu, D. Zhang, Y. Fang, L. Lin</i>	
Comparison of Metal Artefact Reduction Algorithms from Medicine Applied to Industrial XCT Applications	1131
<i>C. Gusenbauer, M. Reier, D. Salaberger, J. Kastner</i>	
The Non-contact Acoustic Inspection Method for Concrete Structures using the Defect Detection Algorithm that Combined Spectrum Entropy with Vibrational Energy Ratio	1140
<i>K. Sugimoto, T. Sugimoto, N. Utagawa, K. Katakura</i>	
A Study of Guided Wave Propagation in Timber Pole using Spectral Finite Element Method	1148
<i>M. Subhani, J. Li, B. Samali</i>	
Thermosonic Testing with Phased Matched Guided Wave Excitation	1158
<i>M. Rahammer, I. Solodov, W. Bisle, D. Scherling, M. Kreutzbruck</i>	
Radiographic Inspection - Film Replacement with Digital Detector Arrays in Aerospace Applications	1167
<i>F. Schulte, K. Bavendiek</i>	
Non-Destructive Damage Detection and Material Characterization of Turbine Components Using Megahertz Range Induction Thermography in Pulsed Mode	1170
<i>W. Frackowiak, O. Bruchwald, S. Zwösch, W. Reimche, H. J. Maier</i>	
Fan Slot Inspection with ECA	1176
<i>V. Massol, M. Noguera, T. Darmedru</i>	
NDT Diagnosis Automation: A Key to Efficient Production in the Aeronautic Industry	1178
<i>S. Barut, N. Dominguez</i>	
High-speed Ultrasonic Testing of ERW Pipes	1186
<i>W. A. K. Deutsch, M. Joswig, R. Kattwinkel, H. Harmuth</i>	
Automated Testing of Bar Stock Materials for Aerospace Applications with Advanced Automation Features	1194
<i>C. Asche, J. Maier, S. Falter</i>	
Ultrasonic Rotational Test Mechanics with Integrated Phased-Array-Technology for Gapless Detection of Oblique Flaws up to $\pm 22^\circ$ by Applying the Paint Brush Method	1207
<i>S. Schmitz, M. Schwabe, P. Meyer</i>	
Development of High Sensitivity Ultrasonic Inspection System for Welding Part of HFW Pipes	1214
<i>Y. Matsui, Y. Izuka, T. Okabe, I. Tomohiro, M. Suzuki</i>	
Inspection of Forged Disc Materials with an Adapted Annular Array and Dynamic Depth Focusing	1221
<i>M. Barth, M. Rjelka, F. Schubert, B. Köhler, T. Beggerow, W. Spruch, M. Bron</i>	
Optimization and Image Quality Enhancement in Inline Computed Tomography	1223
<i>M. Schrapp, J.-C. Grager, K. Schörner</i>	
Evaluation of In-Process Monitoring for Additive Manufacturing by X-Ray Micro Tomography	1225
<i>B. Henkel, J. Bamberg, G. Zenzinger</i>	
3D Crack Analysis in Hydrogen Charged Lean Duplex Stainless Steel with Synchrotron Refraction CT	1226
<i>R. Laquai, T. Schaupp, B. R. Müller, A. Griesche, A. Kupsch, A. Lange, T. Kannengiesser, G. Bruno</i>	
CT Reconstruction on Unstructured Mesh for Multi-material Object	1235
<i>Y. Nagai, Y. Otake, H. Suzuki</i>	
The Development of the First On-Line Industrial CT Detection System of China	1244
<i>D. Hu, H. Chen, Y. Chen, G. Tu, T. Wang</i>	
Micro Computer Tomography (μCT) Set-Up for Long-Term Serial Measurements, Image Evaluation, and Subsequent Compressive Strength Tests on Frozen Sheep Vertebrae for Osteoporosis Research	1249
<i>B. Illerhaus, S. Maenz, S. Bischoff, M. Bungartz, J. Bossert, E. Kunisch, R. Kinne</i>	
Three-dimensional Iterative X-ray Tomography Combined with Radiation Therapy	1256
<i>S. Zolotarev, V. V. Vengrinovich</i>	
Wavelength-Modulated Differential Photoacoustic Spectroscopy (WM-DPAS) for Very Early Detection of Breast Cancer and Blood Oxygenation Level Quantification	1261
<i>S. S. Choi, A. Mandelis</i>	
Acoustic Emission Analysis for Material Characterization of Sea Urchin Spines	1263
<i>A. Jüngert, K. Klang, K. Termin, A. Krebs</i>	
Safety and Organizational Culture in NDT Matter	N/A
<i>B. Fahlbruch, M. Bertovic</i>	

POD Evaluation using Simulation: Progress and Perspectives Regarding Human Factors	1272
<i>N. Dominguez, D. Rodat, F. Guibert, A. Rautureau, P. Calmon</i>	
How NDT Companies Can Benefit From Human Factors Knowledge	1279
<i>B. McGrath, R. Holstein, M. Bertovic</i>	
NDT in Maritime Industries – in the Tense Environment of Economy, Human Factor and Ecology.....	1287
<i>H. Rieder, M. Spies, A. Dillhöfer</i>	
Human Factors in Non-Destructive Testing: A Re-Emerging Field.....	1289
<i>M. Bertovic</i>	
The New Nonlinear Nonstationary Higher Order Spectra for Vibration Monitoring of Rolling Bearings.....	1290
<i>L. Gelman, T. Patel</i>	
An Order Spectrum Based Method to Ensure Consistent Monitoring Through Vold-kalman Filter Order Tracking.....	1291
<i>K. Wang, K. Feng, M. J. Zuo</i>	
Advanced Acoustic Detection System Monitoring Nuclear Power Plant Components	1300
<i>G. Por</i>	
Infrared Thermography for CM and NDT	1308
<i>T. Clauzing</i>	
ICNDT Guide and Recommendations for Qualification and Certification of Condition Monitoring Inspection Personnel	1309
<i>P. Milligan</i>	
Phased-Array Assisted Manual Nozzle Inspection Solution with Data Archiving Capability	1311
<i>J. Habermehl, N. Badeau, M. St-Laurent, G. Prefontaine</i>	

VOLUME 3

New Use of a 3 Degrees Freedom Encoded Arm for Inspection of Welds with a Phased Array Probe.....	1319
<i>D. Flotté, S. Bittendiebel</i>	
3D-Robotized Air-Coupled Ultrasound Measurements of Large Components	1328
<i>W. Adebarh, Y. Bernhardt, M. Kreutzbruck</i>	
Geometric Calibration in Active Thermography Applications.....	1336
<i>T. Schmidt, C. Frommel</i>	
ENIQ-Qualified Visual Examinations by Means of a Remote-Controlled Submarine	1344
<i>E. Tsvetkov, J. Heinius</i>	
CT Parameter Studies for Porous Metal Samples	1352
<i>S. Lindemann, R. Schaller</i>	
Study on Optical Properties of Nano-Cement Mortar using THz/sub-mm Electro-Magnetic Waves	1359
<i>H.-Y. Kim, S. J. Oh, C. Joo, D. Kang</i>	
Optical Inspection of Plastic Packagings	1367
<i>C. Wolf, A. Lehmann, G. Unglaube</i>	
On-Wing Gas-Turbine-Inspection and -Maintenance (Inspection of Very Small Surface Defects)	1369
<i>P. Eckert, R. Weger, S. Pulwer, J. Bauer, S. Schrader, J. Rautenberg, S. Mouti</i>	
Quantitative Characterization of Microstructure Dynamics using Ultra-fast X-ray Tomographic Microscopy.....	N/A
<i>C. Schlepütz, R. Mokso, J. Fife, F. Marone, A. Bonnin, K. Mader, M. Stampanoni</i>	
FEA Based Simulation of Ultrasonic Wave propagation in Isotropic and Orthotropic Media	1373
<i>D. Datta</i>	
Sparse Deconvolution for Ultrasonic Non Destructive Testing Applications	1382
<i>E. Carcreff, S. Bourguignon, A. Duclos</i>	
Phased Array UT Device Utilizes USB 3.0 to Increase Data Throughput for Full-Matrix Capture	1383
<i>G. Dao, R. Lallement</i>	
Advanced Visualization Methods for Tracking the Evolution of Features in 4D-XCT Data	1384
<i>A. Amirkhanov, J. Kastner, E. Gröller, C. Heinzl</i>	
"Innovation Drives Quality" New Generation of High Resolution Acoustical Imaging Technique for Material Characterization and NDT In Automotive and Aircraft Manufacturing	1386
<i>R. G. Maev</i>	
Non-Destructive Testing of CFRP in the Design Process - A Generic Approach to Describe and Optimize Non-Destructive Testing	1388
<i>M. Mosch, R. Oster, C. U. Grosse</i>	
Mobile Active Thermography System for In-Service NDI of Composites – Latest Developments and Applications.....	1396
<i>C. Ferber, M. Wandelt</i>	
Damage Detection and Localization in the Composite Aerospace Components	1398
<i>M. Stefański, M. Dziendzikowski, K. Dragan, A. Katunin</i>	
A Phased Array Ultrasonic Testing of a Manual Thick Austenitic Weld – Feedback	1399
<i>D. Flotté, S. Bittendiebel</i>	
Robot-based In-Process Examination of ITER Dome and First-Wall Panels based on Novel Ultrasonic Tomography Approach.....	1408
<i>A. Bulavinov, R. Pinchuk, T. Gurieva, D. Lyanzberg, A. Lider, D. Demyanuk, D. Sednev, V. Zhvyrblya, G. Filippov</i>	
Ultrasonic Testing of ITER Toroidal Field Coil Cases Closure Welds	1416
<i>P. I. Resa López, C. Pérez Melguizo, F. J. Fernández Muñoz, R. Martínez-Oña López, M. Bolla, P. Barbero, B. Bellesia, D. Kleiner, A. Bonito-Oliva</i>	

Study of Ultrasonic Propagation through Vortices for Acoustic Monitoring of High-Temperature and Turbulent Fluid	1425
<i>N. Massacret, J. Moysan, M.-A. Ploix, J.-P. Jeannot, N. Chaouch</i>	
Numerical Simulation of Ultrasonic Wave Propagation in a Sodium Cooling System in an Inhomogeneous Temperature Field Using the Spectral-Element Method	1436
<i>M. Nagaso, D. Komaitisch, J. Moysan, C. L'Huillier</i>	
Ultrasonic Phased Array Three-Dimensional Imaging Using TFM-based Slice	1438
<i>C. Sun, T. Gang, P. Yu</i>	
Multi-Modes Electromagnetic Ultrasonic Lamb Wave Tomography Imaging for Variable-depth Defects in Metal Plate	1446
<i>S. Huang, Y. Zhang, S. Wang, W. Zhao</i>	
A Feasibility Study of the Guided Wave Tomography for Spot Weld Inspection	1454
<i>S. Kitazawa, K. Asami, K. Tayama, O. Kikuchi, H. Hanawa</i>	
Electronic Reference Images for Flaw Indications in Welds and Castings	1460
<i>U. Zscherpel, U. Ewert</i>	
Imaging Multilayered Objects with Complex Geometry	1468
<i>T. Lukomski, T. Stepiniski</i>	
Numerically Enhanced Eddy Current Inspection of Corrosion Losses of Aircraft Structures	1479
<i>J. Szlagowska-Spychalska, K. Dragan, M. Dziendzikowski</i>	
Thickness Detection of Corroded Steel Plate by Low Frequency Eddy Current Testing	1487
<i>Y. Haga, T. Goda, K. Sakai, T. Kiwa, K. Tsukada</i>	
Application of SLOFEC® and Laser Technology for Testing of Buried Pipes	1495
<i>G. Scheer</i>	
Detection and Imaging of Internal Cracks by Tangential Magnetic Field Component Analysis using Low-Frequency Eddy Current Testing	1504
<i>T. Yasugi, Y. Majima, K. Sakai, T. Kiwa, K. Tsukada</i>	
NDT of Gas Storage Sphere Legs Through 2" of Fireproofing	1512
<i>A. Vajpayee, D. Russell, Y. Yu</i>	
POD as a Tool Evaluating the Quality of Optical NDT Approaches	1522
<i>M. Rauhut, M. Spies, H.-U. Baron, H. Zisik</i>	
Use of Technical Diagnostics at an Assessment of Risk of Failure	1523
<i>V. Musatov, V. Ivanov</i>	
Reliability Aspects and Multi-Parameter POD Formulation for Guided Wave Based SHM Techniques	1531
<i>A. Gianno, M. Carboni, M. Giglio</i>	
Evaluating RT Systems with a New POD Approach	1542
<i>D. Kanzler, C. Müller</i>	
Analysis and Synthesis of NDT Reliability using the Extended Modular Model	1550
<i>C. Müller, M. Bertovic, D. Kanzler, M. Pavlovic, M. Rosenthal, R. Holstein, A. Gianno, A. Zoëga, U. Ronneteg</i>	
Non-Destructive Assessment of Fiber Alignment in CFRP using Eddy Current Testing with Differential Type Probe	1552
<i>H. Kosukegawa, Y. Yoshikawa, R. Urayama, T. Uchimoto, T. Takagi</i>	
Inspection of Aeronautic Multi-Layered Composite Structures using 3D Terahertz Techniques	1560
<i>J. Jonuscheit, C. Matheis, G. Von Freymann, E. Cristofani, M. Vandewal</i>	
NDE of Carbon Fiber Based Materials and Polymers by the Application of High Frequency Eddy-Current Techniques	1562
<i>M. H. Schulze, H. Heuer, M. Pooth, S. Gäbler</i>	
Design and Manufacture of Reference and Natural Defect Artefacts for the Evaluation of NDE Techniques for Fibre Reinforced Plastic (FRP) Composites in Energy Applications	1564
<i>M. Gower, M. Lodeiro, A. Aktas, R. Shaw, C. Maierhofer, R. Krakenhagen, S. Augustin, M. Röllig, L. Knazovická, A. Blahut, C. Monte, R. Judaschke, D. Ségur</i>	
New Approaches to Air-coupled Ultrasound Testing of Composite Lightweight Materials	1574
<i>R. Steinhausen, M. Kiel, C. Pientschke, H.-J. Münch, A. Mück, K. Hahn</i>	
Technological Status of LED Techniques - Application in Non Destructive Testing with Special Emphasis on Magnetic Particle, Penetrant, Visual and Thermographic Inspection	1583
<i>R. Link, A. Ivankov, N. Riess</i>	
Minimization of Impacts on the User's Health and the Environment by PT and MT Consumables	1594
<i>K. Alward, K. Lessmann</i>	
Micro-emulsion Technologies for the Cost Optimization of your Fluorescent Penetrant Inspection Processes	1595
<i>H. W. Berg, L. Verdier, J. Pielmeier, J. Wörner</i>	
Applications of a New NDT Technique Based on Bacterial Cells	1600
<i>T. G. Santos, P. L. Indácio, A. A. Costa, R. M. Miranda, C. C. C. R. De Carvalho</i>	
New Developed AC/DC-Pulse Technology for MT-Testing and Demagnetization of Steel Components	1607
<i>P. Hirsch</i>	
Railway Track Stress-Strain State Control – The Missing Link in the Railroad Traffic Safety	1615
<i>A. Dubov</i>	
The Influence of RCF Crack Propagation Angle and Crack Shape on the ACFM Signal	1620
<i>J. Shen, L. Zhou, J. Warnett, M. Williams, H. Rowshandel, G. Nicholson, C. Davis</i>	
Monitoring of Rail Track Using Guided Wave Ultrasound	1629
<i>P. Loveday, D. Ramatlo, F. Burger</i>	

Detection and Evaluation of Rail Defects with Non-destructive Testing Methods	1637
A. Dey, J. H. Kurz, L. Tenczynski	
Eddy Current Pulsed Thermography for Quantitatively Detecting Metal Subsurface Defect	1646
X. Gong, C. Xu, N. Zhou, J. Xie, L. Zhang	
Improved Modeling of the 3MA System's Incremental Permeability for on-Line Steel Strip Property Assessment	1647
P. Meilland, P. Lombard	
Modeling Approaches for Eddy Current NDT	1655
T. Theodoulidis	
Numerical Simulation in Alternating Current Field Measurement	1657
W. Zheng	
Toward the Experimental Validation of a 3D Numerical Model for Modelling the Electromagnetic Inspection of Ferromagnetic Materials	1665
M. D'Aquino, S. Minucci, C. Petrarca, G. Rubinacci, A. Tamburrino, S. Ventre	
μ-Computed Tomography as a Tool for Inner Structure and Defect Characterization of Materials	1667
R. Stöbel, D. Kiefel	
Non-Destructive Quality Assessment of Bonded CFRP Structure - An Enabler to Structural Eco-Efficiency	N/A
C. Bockenheimer	
Laminographic Inspection of Large Carbon Fibre Composite Aircraft-Structures at Airbus	1668
O. Bullinger, U. Schnars, D. Schulting, B. Redner, M. Tschaikner, U. Ewert	
Recurrence Quantification Analysis for Non-Destructive Evaluation with an Application in Aeronautic Industry	1678
C. Brandt, P. Maagb	
Development and Application of On-line Ultrasonic Inspection Transducers to Be Applied Into Composite Full Scale Structural Tests	1686
C. Miguel Geraldo, F. Montero De Espinosa	
Measurement and Modelling of Through Thickness Ultrasonic Velocity in X70 Pipeline Steel	1693
J. B. Wiskel, J. Kennedy, K. Vasudev, D. G. Ivey, H. Henein	
Porosity Determination of Carbon Fiber Reinforced Plastics (CFRP) in Aviation Applications Using Ultrasound Without a Back Wall Echo	1704
J. H. Kurz, U. Rabe	
Measurement of Wall Thickness and External Diameter in Parallel as well as Calculation of Tube's Geometrical Cross Section Values with a ROWA USIP xx Phased Array Ultrasonic Testing Machine	1713
S. Schmitz, D. Koers	
Quantifying Drilling Induced Delamination in Carbon-Fibre-Reinforced Epoxy Laminates Using a Fast, Manual and Mobile Ultrasonic-Based Procedure as Compared to Low-Magnification Microscopy	1719
S. Schuhmacher, K. Daubert, G. Schoen, A. Haeger, F. Lissek, G. Schneider	
Improvement of On-line Ultrasonic Detection for Internal Flaws in Steel Strip using Adaptive Signal Processing	1730
T. Ozeki, Y. Izuka, H. Takada, M. Hashimoto	
Optimization of the Inspection Duration for SAFT	1736
H. Mooshofer, J. Vrana	
Three Dimensional Characterization of Defects by Ultrasonic Time-Of-Flight Diffraction (TOFD) Technique	1747
F. Honarvar, A. Habibpour-Ledari	
Recent Applications of SAFT Including Beam Field Simulation for Curved Components	1756
H. Rieder, M. Spies, S. Hubel	
Requirements For a Small Size Ultrasonic Imaging System for Inspection of Concrete Elements	1757
K. Mayer, M. Ibrahim, M. Krause, M. Schubert	
A Transmission-tomographic Imaging Setup Combining Elastic and Electromagnetic Wave Functionality	1766
M. Schickert, F. Bonitz	
High Resolution Eddy Current Array (ECA) Application on Complex Shaped Copper-Profiles to Improve the Inspection Efficiency	1774
L. Lindecke	
Surface and Subsurface Material Characterisation using Eddy Current Arrays	1776
G. Mook, Y. Simonin	
Application of Eddy Current Array Technology from the Point of View of a Service Provider	1784
B. Heutling, H.-J. Uebig, M. Awerbuch, W. Sievert, E. Köllner, S. Köllner	
Eddy Current Probes Based on Magnetoresistive Array Sensors as Receivers	1798
N. Sergeeva-Chollet, M. Pelkner, T. Erthner, M. Kreutzbruck, C. Fermon, J.-M. Decitre, J. Paul, F. Cardoso, S. Cardoso, P. Freitas, D. M. Caetano, J. Fernandes, M. Piedade	
Advances in Carbon Steel Weld Inspection using Tangential Eddy Current Array	1805
A. Raudé, M. Sirois, H. Lemieux, J. Crépeau	
Productivity & Reliability Study of Non Destructive Testing Techniques for Inspection of Structural Welds in Construction Industry	1821
S. K. Babu, A. Chan, W. Chan	
From In-Process Monitoring to In-Process Control	1834
H.-U. Baron, A. Ladewig	
A Modified Detectability Criterion for Conventional Radiography Simulation	1835
D. Tisseur, C. Vienne, P. Guérin, A. Peterzol-Parmentier, V. Kaftandjian, P. Duvauchelle, A. Schumm	
'Out' with the Old and 'in' with the New – What is the Implication of Technical Advances within NDT Industry? Is There Still Place for the 'Old School' Approach?	1844
E. Motukisi	

Comparison of Human Visibility on Film Radiography and Various Detectability Parameters Computed on Simulated Radiographs – A Statistical Study.....	1850
V. Kaftandjian, P. Duvauchelle, D. Tisseur, C. Vienne, P. Guérin, A. Schumm	
Selection Matrix for Non-destructive Testing of NPP Concrete Structures	1858
F. Al-Neshawy, E. Sistonen, M. Ferreira, E. Bohner, J. Puttonen	
Use of Guided Wave Inspections to Monitor the Integrity of Nuclear Power Station Boilers.....	1867
P. Mudge, K. Thornicroft, A. Haig, P. Jackson, R. M. Sanderson, E. Hutchison, C. Schneider	
Development of a Robotic Nozzle Inspection with a Flexible Transducer Array	1869
B. Dobigny, O. Wattiau, S. Bey, A. Vanhoye, P. Ancrenaz, P. Dumas, L. Fournier	
Inspection of Inaccessible Areas: The Heysham Case.....	1878
M. Bolander	
Fatigue Damage Evaluation of Casting Austenitic Stainless Steel Based on EBSD Method	1887
X. Zhu, L. Zou, L. Lin, Z. Luo	
Quantification of Internal Air Leakage in Ball Valve using Acoustic Emission Signals.....	1894
C. Xu, G. Han, P. Gong, L. Zhang, G. Chen	
Leak Test of Encapsulated Systems with the Test Medium Compressed Air	1903
J. Lapsien	
Advantages of Carrier Gas Leak Detection using Novel Helium or Hydrogen Leak Detectors with Specific Sensor Types	1910
K. Herrmann, D. Wetzig	
A New Leak Detection System with Innovative Sensor Technology for Integral Test of Hermetically Sealed Objects in Pharmaceutical Applications	1922
P. Bunod	
Acoustic Methods for Leak Detection and Tightness Testing	1924
P. Holstein, M. Barth, C. Probst	
New Approach for a More Detailed Visualisation of Ultrasonic Testing Data of Railway Hollow Axles	1930
U. Völz, P. Heilmann, M. Speiker	
Research on Non-contacted Immersion Ultrasonic Testing Method for Hollow Axles	1935
X. Gao, Y. Zhang, J. Peng, Z. Wang, Y. Tan	
Study of a Train Axle Inspection System for Automatically Detecting Defects in Hollow Axles	1941
I. Gauna, A. Álvarez, D. Flórez, N. Thorpe, R. Delgado De Molina, M. Acebes	
Investigations to Introduce the Probability of Detection Method for Ultrasonic Inspection of Hollow Axles at Deutsche Bahn	1949
A. Zoëga, J. H. Kurz, T. Oelschlägel, A. Rohrschneider, C. Müller, M. Pavlovic, H. Hintze, D. Kanzler	
Mobile Mechanized Ultrasonic Testing on Wheel Set Axles with Longitudinal Drill	1957
A. Weber, K. Rohde	
A Modeling Study of the SLOFEC™ Eddy Current System	1964
F. Foucher, A. Kalai, W. Kelb, S. Ramadan, J. Delemontez	

VOLUME 4

Simulation of Electromagnetic Inspection Techniques Using FEM Analysis.....	1978
Y. Gabi, B. Wolter, R. Kern, C. Conrad, A. Gerbershagen	
Modelling the IMPOC Response for Different Steel Strips	1986
A. Skarlatos, C. Reboud, T. Svaton, A. Martinez-De-Guerenu, T. Kebe, F. Van Den Berg	
Magnetic NDT for Steel Microstructure Characterisation – Modelling the Effect of Second Phase Distribution on Magnetic Relative Permeability	1995
L. Zhou, C. Davis, P. Kok, F. Van Den Berg	
Numerical Model of a Real Defect in Austenite Stainless Steel Heat Exchangers Tube Inspection	N/A
M. C. Lopez Areiza, J. Smiderle Corte, J. Rebello, G. Pereira	
Online-thermography: An Efficient Tool for Optimization of Laser Ablation and Repair of CFRP Structures	2003
P. Menner, A. Hess, S. Grill, E. Zahedi	
Ultrasonic IR Thermography Detection of Defects in Multi-layered Aramide Composites	2012
W. Swiderski, M. Pracht	
Experimental Investigation of Impact Damaging of Carbon Fibre Reinforced Composites	2019
C. Meola, S. Boccardi, G. M. Carloni, N. D. Boffa, E. Monaco, F. Ricci	
Characterisation of Artificial and Natural Defects in Fibre Reinforced Plastics Designed for Energy Applications Using Active Thermography	2027
C. Maierhofer, R. Krankenhagen, M. Röllig, S. Riemer, M. Gower, G. Baker, M. Lodeiro, L. Knazovická, A. Blahut, C. Monte, A. Adibekyan, B. Gutschwager	
New Approaches in Nondestructive Characterisation of the Interface in Metal - CFRP Hybrid Structures	2036
H.-G. Herrmann, M. Schwarz, J. Sunma	
Ultrasonic-Endoscopic NDT Solution Inside a “Ready to Fly” Helicopter Gearbox. Practical Example on H225 Helicopters.....	2044
S. Bernier, P. Beck	
High Resolution Crack Detection on Turbine Blade Roots by the Use of Eddy Current and Ultrasonic Rayleigh Waves	2045
E. Rau, J. Bamberg, J. Burchards, P. Berwig, W. Voelkl	

Non-Destructive Inspection of the Composite Laminated Structures using Ultrasonic Feature Guided Waves	2053
Z. Fan, X. Yu	
New Highly Productive Phased Array Ultrasonic Testing Machine for Aluminium Plates for Aircraft Applications	2055
C. Henkel, M. Sperl, W. De Odorico	
High Contrast Radioscopy System for X-Ray High Energy Control	2063
E. Tosti	
Dark-Field Imaging on Micro- and Macro Focus Sources in Comparison with Normal Micro-CT for Building Materials.....	2072
R. Kaufmann, F. Yang, M. Beltran, S. Hartmann, M. Griffa, P. Lura, A. Neels	
Progress Survey of X-Ray Refraction Imaging Techniques	2076
A. Kupsch, B. R. Müller, M. P. Hentschel, A. Lange, V. Trappe, R. Laquai, Y. Shashev, S. Evsevlev, G. Bruno	
Synchrotron Multi-scale and Time-resolved Microtomography: A Powerful Imaging Technique to Study Microstructures	2085
E. Boller, A. Rack, M. Renier, V. Fernandez, P. Tafforeau	
Synchrotron Radiation Micro-tomography (SR-μCT): A Unique Complementary Tool for NDT	2087
O. Guiraud, B. Fayard, P. Latil	
New Concepts for the Academic Education in the Field of NDT at a German Technical University	2089
C. U. Grosse, K. Pinkert	
Public Organizations and Communities of Knowledge Sources	2101
Z. Klyuev, I. Artemyev, B. Artemiev	
Training and Education Requirements for Occupational Radiation Protection in Industrial Radiography in Germany	2107
A. Steege, C. Kaps, B. Sölder	
International Academic Education in NDT at Master Level.....	2111
C. Boller	
Malaysia National Occupational Skills Standard (NOSS) as Guideline in Developing The Non-Destructive Testing (NDT) Instructional Training Materials.....	2119
S. Hussein, I. M. Zainal Abidin, A. R. Hamzah	
Ultrasonic Response on Artificially Produced Fatigue Cracks in AISI 321 Austenitic Stainless Steel Weld	2131
A. Koskinen, E. Leskelä	
NDE Research of Nuclear Power Plant Primary Circuit Components and Concrete Infrastructure in Finland	2141
T. Jäppinen, M. Ferreira	
Method for Acoustic Characterization of Materials in Temperature	2149
C. Cadot, J.-F. Saillant, B. Dulmet	
A Round Robin Test on Flash Thermography	2158
N. Rothbart, C. Maierhofer, M. Goldammer, F. Hohlstein, J. Koch, I. Kryukov, G. Mahler, B. Stötter, G. Walle, B. Oswald-Tranta, M. Sengebusch	
X-Ray Tomographic In-Service-Testing of Circumferential Pipe Welds - The European Project TomoWELD	2166
U. Ewert, B. Redmer, D. Walter, K.-U. Thiessenhusen, C. Bellon, P. I. Nicholson, A. Clarke, K.-P. Finke-Härkönen, J. W. Scharfschwerdt, K. Rohde	
Nondestructive Characterization Techniques for Assuring the Integrity of Fuel Pins for Fast Reactors	2176
J. Panakkal	
Model of Eddy Current Based Pressure Tube to Calandria Tube Gap Measurement	2183
M. Luloff, J. Morelli, T. W. Krause	
Evaluation of Pipe Wall Thinning from Outside of Piping by Excitation Control Eddy Current Testing	2190
T. Uchimoto, T. Takagi, K. Nakajima, R. Urayama	
Using AE Technique to Monitor the Fracture Behavior in Shaking Table Tests of a Scale-down Mockup of Nuclear RC Structure	2191
K.-C. Pei	
Influence of Chemical Compositions and Thermal Treatments on the Structure and Mechanical Properties of Zirconia Based Thermal Coatings.....	2199
M. C. Ruch, A. Savin, R. Steigmann, N. Iftimie, S. Malo, A. Bruma, M. L. Craus, J. Fava, F. Novy, G. Cosarinsky	
Structural Integrity of Coatings of Zirconia Doped with Ceria on Stainless Steels.....	2207
M. C. Ruch, A. Savin, F. Novy, V. Turchenko, M. L. Craus, J. Fava	
Testing of Ceramics by Ultrasound Microscopy and Vibration Analysis.....	2215
M. Barth, F. Duckhorn, K. Tschöke, C. Tschöpe, B. Köhler	
3D-SAR-Imaging and Thickness Determination of Zirconia Based Coatings on Non-Planar Metal Substrates in the Lower Terahertz Region	2224
D. Oppelt, J. Adametz, J. Schür, M. Vossiek	
Experimental Investigation on the Thermal Conductivity and Ultrasonic velocity of Propylene Glycol based TiO₂ Nanofluids.....	2233
D. Singh, V. Bhalla, A. K. Mathur, M. Wan, P. Dhawan, A. K. Jaiswal, R. R. Yadav	
First Validation of CIVA RT Module with a Linear Accelerator in a Nuclear Context	2240
D. Tisseur, B. Rattoni, H. Lemaire, C. Vienne, R. Guillamet, G. Cattiaux, T. Sollier	
RT Modeling for NDT Recent and Future Developments in the CIVA RT/CT Module	2248
R. Fernandez, L. Clement, D. Tisseur, R. Guillamet, M. Costin, C. Vienne, V. Colombie	
Modeling Computed Radiography with Imaging Plates	2256
M. Yao, V. Kaftandjian, P. Duvauchelle, A. Peterzol-Parmenier, A. Schumm	
Quantitative Simulation of Back Scatter X-ray Imaging and Comparison to Experiments.....	2264
G.-R. Jaenisch, S. Kolkoori, C. Bellon	

NOV-XSIM: A New Fast Simulation Tool for X-ray Computed Tomography Testing	2275
<i>B. Fayard, A. Sonzogni, P. Latil, M. Trlin, O. Guiraud, B. Hesse</i>	
Comparison of Theoretical and Experimental Characteristics of the Acoustic Field Phased Array Probe	2277
<i>V. N. Danilov, L. V. Voronkova</i>	
Modeling and Optimization of Transducers Implementing Technology Magnetic Flux Leakage (MFL)	2285
<i>A. Potapov, V. Syasko, O. Pudovkin</i>	
Tailored Ultrasound Fields for Application in Ultrasonic Testing	2293
<i>S. Standop, D. Holzhauer, W. Lammerich, S. Falter</i>	
New Possibilities of Simulation Tools for NDT and Applications	2300
<i>F. Foucher, R. Fernandez, S. Lonne, S. Le Berre</i>	
Research on Ultrasonic Attenuation of CFRP Based on 2D Real Morphology Void Model	2310
<i>S. Ding, S. Jin, J. Chen, Z. Luo, L. Lin</i>	
Terahertz Time Domain Spectroscopy for the Non-destructive Testing of Plastic Parts	2311
<i>S. Kremling, J. Hauck, G. Schober, T. Hochrein</i>	
Optimisation of Ultrasonic Inspection for 3D Fibre-Tow Mapping in Composite Structures	2319
<i>M. Mienczakowski, L. Nelson, R. Smith</i>	
Innovative Technologies as Enabler for Sorting of Black Plastics	2321
<i>D. Nüßler, R. Gruna, C. Brandt, A. Küter, T. Längle, M. Kieninger, N. Pohl</i>	
THz-ToF Techniques for the Detection of Inherent Discontinuities in Dielectric Materials Based on a SAFT – and an Optical Layer Reconstruction Algorithm	2329
<i>H. Spranger, J. Beckmann, R. Boehm</i>	
Evaluation of a Testpiece for Porosity in Carbon Fibre Reinforced Polymers	2339
<i>J. Kastner, B. Plank, G. Rao</i>	
Non-destructive Identification of the Interlayer Bond Between Concrete Substrate and an Added Repair Layer with Variable Thickness Using Ann.	2346
<i>S. Czarnecki, J. Hola, L. Sadowski</i>	
Development of Phased Array Ultrasonic Testing Application for Detection and Sizing of Orthotropic Steel Deck Fatigue Cracks	2354
<i>N. Yagi, K. Ikeue, T. Makita, D. Furuta</i>	
Study on the Long Distance Non-Contact Acoustic Inspection Method using a Strong Ultrasonic Sound Source	2362
<i>T. Sugimoto, K. Sugimoto, N. Utagawa, K. Katakura</i>	
Advances in Ultrasonic Testing - Research Into the Application of Dry Point Contact Transducers	2370
<i>D. Corbett</i>	
Rock Bolt Inspection by Means of RBT Instrument	2377
<i>T. Stepinski, K.-J. Matsson</i>	
Advanced Computed Laminography using a Priori Information	2384
<i>C. Schorr, L. Dörr, M. Maisl</i>	
Potentials of Full-Vehicle CT Scans Within the Automotive Industry	2393
<i>G. A. Ciliberti, P. Janello, P. Jahnke, L. Keuthage</i>	
Fully Automatic Optical Surface Determination in Computed Tomography	2399
<i>B. Kratz, F. Herold</i>	
The Applications of Industrial CT NDT Technology in Geological Research	2407
<i>Y. Xiao, Z. Chen, D. Yu, Y. Li, L. Ye</i>	
Methodology for the Evaluation of CT Image Quality in Dimensional Metrology	2414
<i>A. Krämer, G. Lanza</i>	
Development of a Training Programme Directed Towards the Certification in Accordance with EN ISO 9712 Standard in a Blended Learning Way	2421
<i>R. Rodriguez, J. Gallardo, E. Romero</i>	
Industrial Demand Versus the NDT Technicians Integrity	2428
<i>A. Chiswo</i>	
Implementation of NDT Performance Evaluation Methodology in the Analysis System INDEVA	2433
<i>D. Algermon, S. Feistkorn, C. Kohl, H. Trautmann, M. Scherrer</i>	
ANDE-1 An ASME Nondestructive Examination and Quality Control Qualification and Certification National Standard	2435
<i>M. L. Turnbow</i>	
ANDE-1 Personnel PQ&C Session A new ASME NDE/QC Personnel Qualification and Certification Standard	2436
<i>M. L. Turnbow</i>	
Using High-Frequency-Impulse-Measurement (HFIM) for Detection of Lubrication Driven WEC-formation	2437
<i>S. Barteldes, W. Holweger</i>	
Radar-based Structural Health Monitoring of Wind Turbine Blades	2445
<i>J. Moll, V. Krozer, P. Arnold, M. Dürr, R. Zimmermann, R. Salman, D. Hübsch, D. Pozdniakov, H. Friedmann, A. Nuber, M. Scholz, P. Kraemer</i>	
NDT-based Assessment of Shrinkages and Dross in Heavy Nodular Cast Iron Components of Wind Energy Turbines	2453
<i>J. H. Kurz, M. Manavipour, M. Kopp, D. Bruche, S. Pudovikov, R. Tschunicky, K. Szielasko</i>	
Thermographic Rotor Blade Inspection from Larger Distances – A Promising Tool for the Maintenance of Wind Turbines	2463
<i>R. Krankenhagen, M. Röllig, T. Worzewski, M. Doroshinasir</i>	

Characterization and Optimization of Ultrasonic Tests for Inspection of Fiber-Reinforced Plastic Composites in Energy Related Applications.....	2471
<i>S. M. H. Hosseini, D. Ségur, R. Boehm, D. Gohlke, T. Heckel, S. Riemer, D. Brackrock, M. Gaal</i>	
Thickness Measurement of Nickel Coatings on Walls of Nuclear Waste Storage Tanks.....	2479
<i>V. A. Syasko</i>	
NDE of the Spent Nuclear Fuel Disposal Canisters.....	2486
<i>A. Koskinen, T. Jäppinen</i>	
Automated Ultrasonic Testing of Large Casted Cask Bodies using Phased Array Techniques.....	2496
<i>T. Schmitte, N. Chichkov, O. Nemitz, T. Hinz, D. Geller, T. Orth, H. Hocks Jr., D. Opalla, J. Frank</i>	
Safe for 1 Million Years – NDT Matters!.....	2505
<i>U. Ronneteg, T. Grybäck, M. Bertovic, C. Müller, M. Pavlovic</i>	
Reliability Analysis of the Phased-Array Ultrasonic System used for the Inspection of Friction Stir Welds of Copper Canisters.....	2514
<i>M. Pavlovic, C. Müller, U. Ronneteg</i>	
Development of Concave and Convex Roll Defect Inspection Technology for Steel Sheets by Magnetic Flux Leakage Testing Method.....	2521
<i>Y. Matsufuji, T. Koshihara, M. Matsumoto</i>	
Thermographic Crack Detection in Hot Steel Surfaces.....	2530
<i>P. Myrach, B. Polomski, E. Le Claire, S. Unnikrishnakurup, N. Vengara, K. Balasubramaniam, M. Ziegler</i>	
Investigations for Determining Surface Crack Depth with Inductive Thermography.....	2538
<i>B. Oswald-Tranta</i>	
Detection of Filament Misalignment in Carbon Fibre Production Using a Stereovision Line Scan Camera System.....	2548
<i>S. Geinitz, A. Margraf, A. Wedel, S. Withus, K. Drechsler</i>	
Non-Contact Inline Monitoring of Thermoplastic CFRP Tape Quality Using Air-Coupled Ultrasound.....	2559
<i>P. Fey, S. A. Meiler, M. Kreutzbrück</i>	
Non-Destructive Testing of Plastics and Composites in the Chemical Processing Industry.....	2567
<i>K. Jacobson, J. Carlson, P. Lindblad</i>	
EU-Project EVITA: Non-destructive Inspection and Testing of Primary Aeronautical Composite Structures Using Phase Contrast X-ray Radiography	2578
<i>V. Revol, K. Kitsianos, I. Koulalis, M. Gresil, R. Chemama, S. Consuelo Garcea, M.-O. Sauer, H. Trétout, G. Kanderakis, A.-M. Madrigal</i>	
Multi-Layered Composite Testing using Low Frequency Ultrasonic Pulse-Compression Techniques.....	2580
<i>M. N. Mohamed, S. Laureti, D. A. Hutchins, M. Ricci, L. Davis, P. Burrascano</i>	
Inspection of Glass Fiber-Reinforced Composite Materials — Comparison of Terahertz and Established NDT Techniques.....	N/A
<i>J. Jonuscheit, C. Matheis, P. Venegas, R. Martínez Edo, Y. Sternberg</i>	
Definition of Requirements for Reference Experiments to Determine and Evaluate Various Damage Mechanisms in Fibre Composites by Acoustic Emission.....	2582
<i>U. Höning, U. Holder, A. Pietzsch, E. Schulze, B. Frankenstein, L. Schubert</i>	
Real-Time Methods for Eddy Current Tomography.....	2590
<i>A. Maffucci, G. Rubinacci, A. Tamburrino, A. Vento, S. Ventre</i>	
Guided Wave Monitoring of Pipes	2592
<i>T. K. Vogt, D. Alleyne, B. Pavlakovic</i>	
Simulation of NDT Inspection in 3D Elastic Waveguide Involving Arbitrary Defect	2593
<i>V. Baronian, K. Jezzine</i>	
Nonlinear Lamb Wave Mixing Technique for Micro-Crack Detection in Plates	2601
<i>J. Jiao</i>	
Solid Woven Carbon Fiber Reinforced Plastic Characterization using Infrared Inspection Technologies	2602
<i>D. Moore, S. M. Shepard</i>	
Fiber Waviness Detection by Electromagnetic Testing in Carbon Fiber Reinforced Plastics.....	2603
<i>A. Tsuda, H. Kawai, Y. Yamaguchi, K. Inagaki, H. Hatanaka, M. Tagami</i>	
Characterization of Multiphase Metal Matrix Composites by Means of CT and Neutron Diffraction	2609
<i>S. Cabeza, T. Mishurova, G. Bruno</i>	
Infinite Life of CFRP Evaluated Non-Destructively with X-Ray-Refraction Topography In-Situ Mechanical Loading	2619
<i>V. Trappe, A. Müller, S. Hickmann</i>	
Inverting X-ray CT Data to Determine Material Properties of Carbon Fibre Reinforced Composites.....	2628
<i>C. Fraij, L. Nelson, R. Smith, P. Wilcox</i>	

VOLUME 5

UT TOFD Characterization of Steam Generator Divider Plates – Dealing with Unfavorable Component Configurations – Engineering and ISI Feedback.....	2629
<i>Y. Forestier, M. Deperrest, C. Paillarés</i>	
Reactor Vessel Inspections in Korean Nuclear Plants.....	2638
<i>E. Doh, C.-H. Lee, W.-H. Kim, J.-Y. Kim</i>	
Higher Harmonic Imaging of Crack Surfaces of SCC in Dissimilar Metal Weld with Ni-based Alloy and Fatigue Crack in Cast Stainless Steel	2639
<i>H. Ishida, K. Kawashima</i>	

Pulsed Eddy Current Technology for Steam Generator Tube Support Structure Inspection	2646
<i>S. Mokros, J. Buck, P. R. Underhill, J. Morelli, T. W. Krause</i>	
In-Process Control of Selective Laser Melting by Quantitative Optical Tomography	2654
<i>J. Bamberg, G. Zenzinger, A. Ladewig</i>	
The Use of Acoustic Emission for Process Monitoring in Steel Processing Lines	2662
<i>J. Niemi, A. Nilsson, H. Sollander</i>	
AkuProLas: Acoustic Inline Process Monitoring for Laser Welding Applications	2670
<i>M. Bastuck, H.-G. Herrmann, B. Wolter, D. Böttger, P.-C. Zinn</i>	
Non-Destructive Online-Testing Method for Friction Stir Welding Using Infrared Thermography	2680
<i>I. Kryukov, S. Schüddekopf, S. Böhm, M. Mund, S. Kreling, K. Dilger</i>	
ICNDT WG1 on Qualification and Certification – Efforts on Global Harmonization of the Process of Personnel Certification	2688
<i>A. Mullin</i>	
How to Deal with the ISO 9712 in a Globally Acting Company?	2693
<i>S. Frank, H. Rauschenbach</i>	
A Proposal for a Structured Approach for the Industrial Experience Component of the Qualification for NDT Personnel Prior to Certification – The South African Experience	2701
<i>M. Johannes</i>	
Responsibilities of the Certificate Holder and the Employer - in Light of ISO 9712:2012	2709
<i>N. Mahmutyazicioglu</i>	
Non-destructive Evaluation of Stress Corrosion Cracking under Micro Cell by Acoustic Emission and Video Microscope	2710
<i>M. Shiwa, H. Masuda, H. Yamawaki, K. Ito, M. Enoki</i>	
New Eddy Current Inspection Technology for Detection and Differentiation of Stress Corrosion Cracking (SCC) at and underneath Alloy 625 Cladding at Roughest Surfaces and the Measurement of the Thickness of Welded Claddings	2718
<i>I. Becker</i>	
Detecting Internal Hot Corrosion of In-service Turbine Blades Using Neutron Tomography with Gd Tagging	2720
<i>C. M. Sim, H. S. Oh, S. S. Kwak, Y. H. Hwan</i>	
Comparison Corrosion Mapping Solutions using Phased Array, Conventional UT and 3D scanners	2721
<i>J. Turcotte, P. Rioux, J.-A. Lavoie</i>	
Practical Ultrasonic Damage Monitoring on Pipelines Using Component Analysis Methods	2731
<i>C. Liu, J. Dobson, P. Cawley</i>	
Feasibility of Passive SHM for Corrosion Detection by Guided Wave Tomography	2739
<i>T. Druet, B. Chapuis, P. Calmon, E. Moulin</i>	
Offshore Foundation Monitoring by Guided Waves – Challenges and Perspectives	2747
<i>B. Weihacht, B. Frankenstein, T. Gaul, R. Neubeck, L. Schubert</i>	
Non-Invasive Monitoring Strategies for Engineering Structures using Guided Waves	2755
<i>P. Jackson, P. Mudge</i>	
Metal Magnetic Memory Technique - Prospects and Restrictions	2763
<i>R. Stegemann, N. Sonntag, S. Cabeza, W. Sharatchandra Singh, G. Bruno, B. Skrotzki, M. Kreutzbrück</i>	
Certification Scheme Based on the ISO 9712:2012 for NDT Personnel Certification by the Metal Magnetic Memory Method (ISO 24497:2007)	2765
<i>S. Kolokolnikov, A. Dubov</i>	
Magnetic Impedance based Spectral Tomography for Detection of Structural Inhomogeneity	2772
<i>I. Kecskés, P. Trampus, P. Odry</i>	
Research on Magnetic Memory Effect of the Ferromagnetic Materials during the Friction Process	2779
<i>K. Zhao, J. Fan, F. Gao, Z. Hu, D. Li, M. Hong</i>	
Rapid and Comprehensive Detection and Characterization Using a Fully Autonomous Robotic NDE Platform RABIT	2788
<i>N. Gucunski, B. Basily, J. Kim, K. Dinh, T. Duong, S.-H. Kee, A. Maher</i>	
Application Limits of NDT Methods for Reinforced and Prestressed Concrete Members in Practice	2796
<i>C. Sodeikat</i>	
Development of an Efficient Air-Coupled Impact-Echo Scanner for Concrete Pavements	2804
<i>R. Groschup, C. U. Grosse</i>	
Polarized Ultrasonic Shear Waves to Estimate Stresses in Structural Concrete	2812
<i>A. Hafiz, L. Mhamdi, T. Schumacher</i>	
Development of an Eddy Current based Inspection Technique for the Detection of Hard Spots on Heavy Plates	2813
<i>G. Schneibel, C. König, A. Gopalan, J.-M. Dussaux</i>	
Real-time Filter Technique for Effective Denoising of High Frequency EC Signals	N/A
<i>T. Schmitte, T. Hinz, O. Nemitz, T. Orth, C. Liick, J. Bald</i>	
Industrial Eddy Current Array Testing Solution for Cylindrical Products	2821
<i>M. Mavadat, B. Lepage</i>	
Eddy Current Nondestructive Testing of Large Diameter Pipes Through Thick Protective Coatings.	2830
<i>A. Efimov, A. Shubochkin, E. Martyanov</i>	
Recent Advances in Handheld X-Ray Fluorescence Based Alloy PMI/Material Testing	2839
<i>A. Thurston</i>	
Only the Combination of Different NDT Methods of Material Characterization is the Key to Success	2847
<i>L. Spiess, G. Teichert, R. Bottcher, T. Kups, P. Schaaf</i>	

Experimental Measurement of Nano-Deformation and in Situ Strain Using Nanoindentation, Picoindentation and Digital Image Correlation.....	2853
<i>C.-Y. Chang, C.-C. Ma, W.-H. Chou, C.-R. Lee</i>	
Combined Portable Hardness Testing Solution to Increase the Efficiency of Inspection & Quality Control Processes.....	2855
<i>A. Akhlaghi, C. Frehner</i>	
A New Nondestructive Testing Method for the Blade Roots of In-service Steam Turbines Based on Ultrasonic Distortion Wave.....	2863
<i>L. Zhu, Q. Ding, J. Zhang</i>	
Phased Array Ultrasonic Inspection of Nozzles.....	2871
<i>C. Carpentier, K. Tochnit, C. Nageswaran</i>	
Assessment of Microstructural Changes in Grade 91 Power Station Steel through Magnetic Measurements.....	2873
<i>J. Wilson, M. Vaidhianathan, J. Liu, C. Davis, A. Peyton</i>	
Ultrasonic Inspection of Nickel Alloys and Nickel Alloy Welds for High-temperature Applications in Modern Coal-fired Power Plants	2881
<i>S. Wagner, S. Dugan</i>	
Evolution of the Ultrasonic Inspection Over the Past Decades on the Example of Heavy Rotor Forgings	2890
<i>J. Vrana, A. Zimmer, H.-P. Lohmann, W. Heinrich</i>	
High Speed Cone Beam CT for Production Process Control using Innovative Scatter Correcting Technology	2901
<i>O. Brunke</i>	
Applications of Active Thermography for Full Inspection in Parts Manufacture.....	2902
<i>D. Hou, S. Ye</i>	
Design, Calibration and Validation of 24 GHz Resonators for Epoxy Resin Cure Monitoring Systems in the Fibre-Reinforced Plastics Fabrication	2910
<i>J. Groh, J. Schür, M. Javadiehyan, G. Ziegmann, M. Vossiek</i>	
Application of Infrared Thermography Technique for the Monitoring of Cold Metal Transfer (CMT) Joining of Aluminium to Galvanized Steel	2921
<i>R. T. Kidangan, S. Unnikrishnakurup, P. Nithin, K. Balasubramaniam, P. Rajagopal, K. V. Phani Prabhakar, G. Padmanabham</i>	
Early Inspection of Drill String Fatigue Damage Based on Metal Magnetic Memory Method	2929
<i>Z. Hu, J. Fan, X. Su, F. Gao, K. Xin</i>	
Training For Phased Array Ultrasonic Testing – An Innovative Approach	2936
<i>N. Harrap</i>	
Need for Certification of Personnel on Phased Array, TOFD and Digital Radiography.....	2937
<i>V. Sokovnin, N. Volkova, A. Mullin, V. Strizhakov</i>	
Challenges on Harmonization of National Approaches to Administration of Practical Examination	2938
<i>S. K. Babu</i>	
Harmonized NDT Training, Qualification, Certification and Designation as implemented within the South African NDT Industry	2945
<i>H. Jansen</i>	
Qualification in NDT – Necessary Evil or Sensible Decision?	2953
<i>R. Aljah</i>	
Measurement of Corrosion Wall Loss at Contact Supports.....	2954
<i>T. Pialucha, B. Pavlakovic, D. Alleyne, T. K. Vogt</i>	
Corrosion Detection Under Pipe Supports Using EMAT Medium Range Guided Waves	2955
<i>V. Garcia, C. Boyero, J. A. Jimenez Garrido</i>	
High-Resolution Corrosion Monitoring for Reliable Assessment of Infrastructure	2964
<i>A. Lamarre</i>	
Pulsed Eddy Current: New Developments for Corrosion Under Insulation Examinations	2971
<i>M. Grenier, V. Demers-Carpentier, M. Rochette, F. Hardy</i>	
HOIS JIP Experience of Inspection of Un-insulated External Corrosion to Determine the Remaining Wall Thickness – A Challenging NDT Requirement	2981
<i>S. Burch</i>	
On- and Offline Ultrasonic Inspection of Additively Manufactured Components	2983
<i>H. Rieder, M. Spies, J. Bamberg, B. Henkel</i>	
Modelling of Condition Monitoring with Imperfect Inspections	2991
<i>V. Ulansky, A. Raza</i>	
Novel NDT Technique for Detection of Delamination Type Defects in Structural Health Monitoring of Composites	3000
<i>V. Samaitis, L. Mazeika</i>	
Condition Recognition of Valve Internal Leakage Based on Infrared Thermography	3002
<i>L. Zhang, C. Xu, G. Han, N. Zhou</i>	
Prototypic Simulation Platform for Structural Health Monitoring Ultrasonic Transducer Networks	3003
<i>R. Sridaran Venkat, C. Boller, N. B. Ravi, D. R. Mahapatra, N. Chakraborty</i>	
Energy Diagnostics - Is a Physical Basis of the Metal Magnetic Memory Method	3012
<i>A. Dubov</i>	
Non-Contact Magnetometric Diagnostics of Welded Joints of Main Gas Pipelines Susceptible to Sudden Failures	3019
<i>S. Kolokolnikov, A. Dubov, A. Dubov</i>	
Surface Inspection and Remanence Imaging with Magnetic Field Distortion Measurement	3024
<i>S. Youssef, K. Szielasko, A. Sourkov, B. Gupta, A. Youssef</i>	
About a New Classification of NDT Methods Based on Risks and Component Service Life	3032
<i>A. Dubov, P. Ladanyi, P. Trampus</i>	

Study on Stress Concentration Testing and Integrity Assessment of Offshore Oil and Gas Wells Casing	3035
<i>X. Zhang, J. Fan, D. Liu, L. Sun</i>	
Optimal Mix Design of Glass Reinforced Cementitious Specimens Based on Innovative Ultrasonic Wave Features	3044
<i>S. Iliopoulos, D. G. Aggelis</i>	
Efficiency of Self-healing Agents for Cementitious Materials Characterized by NDT	3051
<i>F. Malm, C. U. Grosse</i>	
Establish a Process to Detecting the Damage Depth of Concrete Structures after Exposure to High Temperatures by the Impact Echo Method	3059
<i>H. Yang, Y.-C. Lin</i>	
Research on Radiographic Testing of Steel Wire Ropes in Suspension Bridges	3067
<i>P. C. Peng, C. Y. Wang</i>	
NDT in Building - Examination of a Mounting Plate Made of Concrete and the Subsoil as Part of a Failed Lifting Operation	3072
<i>A. Hasenstab, R. Schaar</i>	
A Fast General Spectrum Model for Quantitative Radiography Simulation	3080
<i>A. Deresch, C. Bellon, G.-R. Jaenisch</i>	
A Tool for Insertion of Simulated Flaws on Real Acquisition Files	3087
<i>S. Bannouf, S. Lonne, P. Dubois</i>	
New Way to Handle Ultrasonic Complex Examinations	3095
<i>J. M. Puybouffat, D. Agostino, N. Gachadois, M. Conessa</i>	
Simulation of Ultrasonic Inspection of Complex Components Using a 3D-FDTD-Approach	3103
<i>A. Pandala, K. Balasubramaniam, M. Spies</i>	
A Numerical Approach for the Simulation of Impact Echo Measurements	3111
<i>H. Gravenkamp, C. Völker, F. Krome, R. Boehm</i>	
Ultrasonic Assessment of Metal Microstructures, Modelling and Validation	3112
<i>A. Volker, M. De Soares Silva E Melo Mota, H. Wirdelius, P. Lundin, D. Krix, P. Kok, A. Martinez-De-Guerenu, I. Gutierrez</i>	
Magnetic Susceptibility Imaging as a New Approach towards Characterization and Testing of Para- and Diamagnetic Materials	3120
<i>K. Szielasko, B. Gupta, J. H. Kurz</i>	
A Comparison Between ASTM E588 and SEP 1927 Relating Resolution Limits at Determination of the Purity Grade	3127
<i>D. Kotschate, D. Gohlke, R. Boehm, M. Perez Alonso</i>	
The Application of Electromagnetic Measurements for the Assessment of Skin Passed Steel Samples	3137
<i>A. Peyton, N. Karimian, J. Wilson, M. Stolzenberg, R. Schmidt, C. Davis, L. Zhou, P. Lombard, P. Meilland, A. Martinez-De-Guerenu, K. Gurruchaga</i>	
Nondestructive Determination of Textural Features in Steel Sheet	3145
<i>M. Stolzenberg, T. Evertz, M. Witte</i>	
Adaptive Ultrasonic Imaging with a Phased-array Probe Equipped with a Water-filled Conformable Wedge	3153
<i>S. Robert, F. Cartier, L. De Roumilly, R.-O. Mondou, P.-E. Lhuillier, G. Garzino</i>	
Practical Application of Total Focusing for Sizing of Imperfections in Welded Joints	3161
<i>M. Berke, S. Koralewski, U. Kaps, W. Roye, L. Le Ber</i>	
Application of a FMC/TFM Ultrasonic System to Inspection of Austenitic Welds	3162
<i>R. Ten Grotenhuis, A. Chen, A. Hong, Y. Verma</i>	
Advantages and Complementarity of Phased-Array Technology and Total Focusing Method	3171
<i>F. Reverdy, G. Benoit, L. Le Ber</i>	
Application of the Total Focusing Method for Improved Defect Characterization in the Production of Steel Tubes, Pipes and Plates	3179
<i>T. Schmitte, O. Nemitz, N. Chichkov, T. Orth</i>	
Characterization of Cohesive and Adhesive Properties of Adhesive Bonds Using Transmitted Ultrasonic Waves	3187
<i>E. Siryabe, M. Rénier, A. Meziane, J. Galy, M. Castaings</i>	
Discrimination of Different Levels of Adhesion in a Bi Layer Aluminum/Epoxy Structure Using Lamb Waves	3192
<i>C. Gauthier, M. Ech Cherif El Kettani, J. Galy, D. Leduc, M. Predoi, J.-L. Izicki</i>	
Adhesive Thickness Measurement on Composite Aerospace Structures using Guided Waves	3198
<i>L. Taupin, B. Chapuis, M. Ducouso, F. Jenson, N. Cuvillier</i>	
Crack Growth Monitoring at CFRP Adhesive Bondings	3207
<i>W. Adegbahr, R. Sachse, P. Middendorf, M. Kreutzbruck</i>	
Development and Optimization of the Laser Shock Wave Adhesion Test for Composite Bonding Quality Assessment	3215
<i>R. Ecault, N. Dominguez, H. Voillaume, B. Campagne, L. Berthe, M. Boustie, F. Touchard</i>	
Resonant Defects: A New Approach to Highly-sensitive Ultrasound-activated NDT Techniques	3223
<i>I. Solodov, M. Kreutzbruck</i>	
Detection of Pipe Wall-thinning Based on Change of Natural Frequencies of Shell Vibration Modes	3230
<i>S. Han, J. Park, T. Kang</i>	
Local Defect Resonance-based Shearography to Increase the Selectivity of Defects	3238
<i>N. Gulnizkij, I. Solodov, M. Kreutzbruck</i>	
Identification of Flawed CFRC Samples Using Local Acoustic Resonance Spectroscopy (LARS)	3246
<i>P. Jatzlau, M. Müller, C. U. Grosse</i>	
Corrosion Detection and Measurement Improvement Using Advanced Ultrasonic Tools	3254
<i>L. Le Ber, G. Benoit, P. Dainelli</i>	

Corrosion Detection by Means of Acoustic Emission (AE) Monitoring	3262
<i>P. Tscheliesnig, G. Lackner, A. Jagenbrein</i>	
Ultrasonic Inspection for Stress Corrosion Cracking in Weld Overlay Cladding	3270
<i>A. Dias, C. Nageswaran</i>	
Measurement of Residual Thickness in Case of Corrosion Close to the Welds with an Adaptive Total Focusing Method	3271
<i>O. Roy, P. Benoist, P. Bergalonne, C. Chevallier</i>	
Modelling Based Optimization of Digital Radiography for Subsea Pipelines	3279
<i>M. I. Haith, U. Ewert, S. Hohendorf, C. Bellon, A. Deresch, P. Huthwaite, M. Lowe, U. Zscherpel</i>	
Vibration Signal Modeling for a Planetary Gear Set	3281
<i>L. Liu, X. Liang, M. J. Zuo</i>	

VOLUME 6

Potential Drop Creep Strain Monitoring	3289
<i>J. Corcoran, P. Cawley, P. Nagy</i>	
Enhanced Sensitivity of Low Frequency (LF) RFID Sensor Signal for Structural Health Monitoring (SHM) in High Temperature Environment	3296
<i>A. Imam, G. Y. Tian</i>	
Structural Health Monitoring of Compressor Blades with the use of Variable Reluctance Sensor and Impedance Method	3304
<i>M. Witos, M. Wachlaczko</i>	
Development of the Fabrication Process and Characterization of Piezoelectric BaTiO₃/Epoxy Composite to the Used for Coated Ultrasonic Transducer Patterns in Structural Health Monitoring	3312
<i>O. Barreiro Ferreira, R. Sridaran Venkat, J. Adam, C. Boller</i>	
Detection of Casting Defects in Aluminum Slabs by Laser Ultrasonic Measurements	3321
<i>J. Roither, T. Mitter, B. Reitinger, A. Wiesinger, C. Hofer, H. Grün, P. Burgholzer</i>	
Laser Ultrasonic Characterisation of Rolled Steel Strip: Wave Propagation in Inhomogeneous Thin Sheets	3328
<i>D. Krix, R. Schmidt, M. Mota, A. Volker</i>	
Defect Detection Using High-Frequency, Non-Contact Ultrasound Under a Practical Point of View	3336
<i>T. Windisch, F. Schubert, B. Köhler</i>	
Robot-based Solutions for NDT Inspections: Integration of Laser Ultrasonics and Air Coupled Ultrasounds for Aeronautical Components	3338
<i>E. Cuevas Aguado, E. Cabellos, S. Hernandez</i>	
Fast Non-Contact Defect Imaging with Scanning Laser Source Technique	3347
<i>T. Hayashi, M. Fukuyama, K. Ishihara</i>	
Capability of Modern Tank Floor Scanning with Magnetic Flux Leakage	3355
<i>J. Costain, N. Pearson, M. Boat</i>	
Automated Material Identification Using Magneto Inductive Eddy Current Technique in Combination with Self-Learning Algorithms	3366
<i>A. Bergmann, A. Geringer, M. Kaack, T. Orth, S. Nitsche, R. Peters, K.-D. Müller, S. Weltgen</i>	
Flexible PCB Eddy Current Array Probes for the Surface Inspection of Welds and Pipes	3367
<i>A. Lamarre</i>	
Thickness Measurement of Steel Plate Using Magnetic Principle	3368
<i>Z. S. Lim</i>	
Chill Marks Effects Detection Algorithm for Plant IMPOC Data	3370
<i>G. Nastasi, C. Mocci, V. Colla, F. Van Den Berg, R. Mulder, W. Beugeling, T. Kebe</i>	
Mode-converted Diffuse Ultrasonic Scattering from Elongated Grains	3378
<i>P. Hu, A. Arguelles, C. Kube, J. Turner</i>	
Characterisation of the Reflection Behavior of Lap-Type Defects in Steel Tubes with Photoelastic Effect and UT Simulation	3379
<i>T. Orth, M. Kaack, A. Germes, A. Koka</i>	
Modelling Ultrasonic Attenuation Due to Scattering in Complex Microstructures	3380
<i>C. Davis, M. Strangwood, D. Neumann</i>	
Simulation of Ultrasonic Materials Evaluation Experiments in Complex Media	3382
<i>S. Hirsekorn, D. Dobrovolskij, M. Spies</i>	
Image-Based Finite Element Simulation of Ultrasonic Wave in Polycrystalline Metal using Phase-Field Modeling	3384
<i>K. Nakahata, N. Mizokami</i>	
Supervision on the Hardening Process of Roller Bearings by using Eddy Current Testing Methods	3391
<i>M. Seidel, R. Schüffler, G. Dobmann, W. Morgner</i>	
Detection of Near Surface Damages in Crank Shafts by using Eddy Current Testing	3399
<i>A. Zösch, C. Seidel, K. Härtel, M. Seidel, J. Maier, G. Neun</i>	
Characterization of Cold Rolling-Induced Martensite in Austenitic Stainless Steels	3407
<i>M. C. Ruch, J. Fava, C. Spinosa, M. Landau, G. Cosarinsky, A. Savin, F. Novy, V. Turchenko, M. L. Craus</i>	
In-Situ Monitoring of the Microstructure Evolution Using Eddy Current Technology	3419
<i>O. Bruchwald, W. Frackowiak, S. Zwoch, W. Reimche, H. J. Maier</i>	
Material Characterization of Thin Coatings Using High Frequency Eddy Current Technology	3426
<i>O. Bruchwald, M. Nicolaus, W. Frackowiak, W. Reimche, K. Möhwald, H. J. Maier</i>	

The Use of Ultrasonic Inspections at Elevated Temperature	3432
<i>F. Gabriëls, R. Eras</i>	
Ultrasonic and Magnetic Particle Testing of New Railway Wheels.....	3437
<i>W. A. K. Deutsch, W. Weber, K. Maxam, M. Razeng, F. Bartholomai</i>	
Experience with Advanced NDT Methods in Turbine Field Service.....	3445
<i>H. Rauschenbach, M. Opheys</i>	
Ultrasound Tomography on Hyper Velocity Impact Targets	3453
<i>M. Raith, C. U. Grosse</i>	
Application of Pseudo-Stochastic Excitation in Ultrasonic Echo Experiments for Improved Time-resolution at Low Frequencies.....	3461
<i>P. Holstein, G. Ziegenhals, A. Tharandt, K. Gillmeister, A. Bodí</i>	
Bondline Boundary Assessment of Cohesive Bonded Solid Woven Carbon Fiber Composites Using Advanced Diagnostic Methods	3469
<i>S. Stair, D. Moore, C. Nelson</i>	
In-situ Ultrasonic Testing of Polymeric Adhesive Bonds Exposed to Complex Mechanical and Environmental Loads.....	3478
<i>U. Rabe, U. Netzelmann, S. Hirsekorn</i>	
Development of an Industrialized Inspection Method to Monitor the Wetting Behavior of CFRP Parts Prior Bonding Or Coating	3486
<i>F. Stark, R. Ganss, C. Cherrier, F. Eder</i>	
Innovating for Structural Adhesive Bonding Evaluation and Analysis with Ultrasounds : A Summary	3488
<i>J. Moysan, J. Galy, E. Siryabe, C. Gauthier, L. Foze N'Djomo, M. Ech Cherif El Kettani, C. Potel, M. Bruneau, M. Renier, A. Meziane, D. Leduc, A. El Mahi, M. Castaings, J.-L. Izbicki, N. Massacret</i>	
Finite Element Simulation of Ultrasound Propagating Through the Interface of Diffusion Bonded Dissimilar Nickel-Based Alloys.....	3498
<i>Z. Sha, Y. Shi, J. Liang, F. P. Dunne, B. Lan</i>	
Progress in Modelling the Mechanical Performance of Composites with Winkles and waviness Based on NDT Data	3507
<i>N. Xie, S. Mukhopadhyay, R. Smith, S. Hallett</i>	
Inductive Thermal Nondestructive Evaluation: Multi-dimension Pattern Interpretation and Separation.....	3509
<i>B. Gao, Y. Zhu, W. L. Woo, G. Y. Tian</i>	
Experimental Validation of Ultrasonic Analytic-Signal Analysis of Composite Laminates	3517
<i>R. Smith, L. Nelson, M. Mienczakowski</i>	
Quantitative Defect Reconstruction in Active Thermography for Fiber-Reinforced Composites.....	3518
<i>S. Götschel, C. Maierhofer, J. P. Müller, N. Rothbart, M. Weiser</i>	
Monitoring Fatigue Damage in CFRP Using Ultrasonic Birefringence	3528
<i>P. Fey, M. Kreutzbrück</i>	
Laser Speckle Photometry (LSP) - Optical Sensor System for Monitoring of Material Condition and Processing	3538
<i>U. Cikalova, B. Bendjus, S. R. Sudip, L. Chen</i>	
Shearography as Non-Destructive Testing Method in the Application of Adhesive Tapes	3545
<i>I. Kryukov, S. Böhm, M. Schach</i>	
Smaller Than the Eye Can See: Vibration Analysis with Video Cameras.....	3553
<i>O. Buyukozturk, J. Chen, N. Wadhwa, A. Davis, F. Durand, W. Freeman</i>	
Photothermal Coherence Tomographies – Principles and Non-Destructive Imaging Applications	3563
<i>A. Mandelis</i>	
Non-destructive Testing of Green Sanitary Ceramics by Microwaves and an Active Thermographic Technique	3564
<i>G. Walle, C. Sklarczyk, U. Netzelmann</i>	
Optimized ATEX Acoustic Emission Measuring Chains for Particle Size Monitoring in Industrial Plants	3574
<i>M. Dumont, S. Collura, T. Urbank, D. Rossetti</i>	
Research on the Signal Propagation Characteristics of Acoustic Emission and Localization of the Gas Pipe Network Leak.....	3584
<i>P. Gong, C. Xu, G. Han, H. Shi, G. Chen</i>	
The Virtual Tap Test – A Training System for Wind Turbine Rotor Blade Inspectors	3593
<i>G. Andreisek, D. Korthals, C. U. Grosse, B. U. Seiber</i>	
Structural Health Monitoring and Non Destructive Testing of Fatigue Crack Growth in Bonded CFRP-CFRP Lap Joints	3600
<i>A. Gianneo, M. Carboni, A. Bernasconi, R. Galeazzi</i>	
Smelting Furnace Non Destructive Testing (NDT) and Monitoring.....	3611
<i>A. Sadri, W. L. Ying, J. Erskine, R. Macrosty</i>	
Flexible Ultrasonic Transducer for Laser Ultrasound Imaging of Defects in Curved Structures	3623
<i>T.-C. Wu, M. Kobayashi, C.-C. Cheng, C.-H. Yang</i>	
A New Concept for the Non-Destructive Testing of Fiber-Reinforced Plastics via Laser Generated Ultrasonic Guided Waves	3631
<i>B. Kelkel, R. Sebastian, M. Gurka, T. Traub, J. L'Huillier, J. Poltawski, S. Günster</i>	
Fast Inversion Calculation for Full-field Measurement of Material Properties with Quantitative Laser Ultrasound Visualization System	3643
<i>S.-P. Tseng, C.-H. Wu, C.-H. Yang</i>	
Evaluation of Friction Stir Welding Process by Laser Ultrasonic Method with Synthetic Aperture Focusing Technique	3651
<i>Z. Zhou, K. Zhang</i>	

Through-lifecycle Product Quality in Additive Manufacturing	3658
<i>K. Milne, M. Felice, N. Brierley, B. Dutton, M. Rosli, J. Dawes, L. Huertas, M. Rahman</i>	
Influence of the Water and Aggregate-to-Cement Ratio on the AE Activity of Fresh Concrete	3659
<i>S. Iliopoulos, Y. El Khattabi, D. G. Aggelis</i>	
Acoustic Emission Monitoring of Reinforcing Bars Pull-out from Concrete Matrix	3667
<i>P. L. Nguyen, J. Vantomme, D. G. Aggelis</i>	
Pullout Experiments on Bonded Anchors Monitored Via Acoustic Emission Techniques	3675
<i>M. Botz, M. Raith, C. U. Grosse</i>	
Bridge Testing and Monitoring of Steel Components with Acoustic Emission	3676
<i>M. Löhr</i>	
Monitoring of the Structural Behaviour of Hybrid Concrete Beams by Means of Acoustic Emission and Digital Image Correlation	3677
<i>D. G. Aggelis, S. Verbruggen, S. De Sutter, S. Iliopoulos, T. Tysmans</i>	
Bandwidth of MFL in Steel Plate Inspection	3685
<i>N. Pearson, M. Boat, J. Mason</i>	
Inspection Configuration Design for Automated Ultrasonic Testing of Large Casted Cask Bodies using Phased Array Techniques	3697
<i>T. Orth, T. Schmitte, N. Chichkov, H. Hocks Jr., D. Opalla, J. Frank</i>	
Validation of Ultrasonic Wave Propagation in Austenitic Welds	3698
<i>L. Zhao, S. Limthongkul, C. Nageswaran</i>	
Modelling the ECT of U-Bend Steam Generator Tubes by the Boundary Element Method	3699
<i>E. Demaldent, C. Reboud, F. Nozais, J.-M. Decitre, T. Sollier, G. Cattiaux</i>	
Overview of the Finite Elements Modeling of the Ultrasonic Propagation in Complex Media at EDF R&D	3707
<i>P.-E. Lhuillier, A. Schumm, B. Chassignole, B. Lathuiliere, T. Autrusson, S. Shahjahan, O. Saulauze</i>	
Theory and Practice of Thermographic Signal Reconstruction	3716
<i>S. M. Shepard</i>	
Laser Projected Photothermal Thermography for Characterizing Hidden Defects	3718
<i>E. Thiel, M. Kreutzbruck, M. Ziegler</i>	
Induction Excited Thermography in Industrial Applications	3724
<i>C. Srabir</i>	
Data Processing Procedures for Defects Evaluation in Composite Materials by Means of Stimulated Thermography	3733
<i>U. Galietti, D. Palumbo</i>	
Accuracy in Sizing Discontinuities with Phased Array Ultrasonic Technique	3742
<i>G. Nardoni, M. Certo, P. Nardoni, M. Feroldi</i>	
Improved Inspection of CRA-Clad Pipe Welds with Accessible Advanced Ultrasonic Phased-Array Technology	3752
<i>A. Lamarre</i>	
Phase Array Ultrasonic Testing (PAUT) & Time of Flight Diffraction (TOFD) of DSS Piping of Very High Thickness (70 mm)	3759
<i>A. Khare, S. Mistry</i>	
Investigation of Ultrasonic Techniques for Inspection of Dissimilar Joints	3766
<i>E. Jasuniene, L. Mazeika, E. Zukauskas, V. Samaitis, V. Cicenas</i>	
Use of Sectorial Scanning for Anisotropic Weld Inspection	3768
<i>B. Dupont, J.-Y. Rolland, G. Verdeil, J. Poirier</i>	
Optimization of Spot Welding Processes in Low Carbon Hot Rolled Sheets	3775
<i>A. I. Butt, I. Saleem</i>	
PHAsis.one – Phased Array Spotweld Inspection System	3782
<i>E. Roddewig, B. Vogt</i>	
Remanent Magnetization for Non-Destructive Testing of Spot Welds	3786
<i>C. Mathisik, J. Zschetzche, C. Grossmann, U. Füssel</i>	
Imaging Ultrasonic Testing of Resistance Spot Welds – Manual and Automated Testing Procedure	3797
<i>M. Huppmann, C. Schmidt, Y. Lin</i>	
Development of an Automated Ultrasonic Inspection Device for Quality Control of Spot Welds	3799
<i>M. Acebes, R. Delgado De Molina, I. Gauna, N. Thorpe, J. C. Guerro</i>	
Technical and Practical Requirements, New Possibilities, Actual and Upcoming Standardization of UV-LED Lamps for Fluorescent Magnetic-Particle- (MPI) and Penetrant Inspection (FPI)	3807
<i>M. Breit</i>	
Monitoring of Penetration System Performance due to ISO 3452-1 by using Test Panels due to ISO 3452-3	3809
<i>A. Kinzel, W. König, H. Kühn, N. Dittmar</i>	
The Implementation of the New Standard EN ISO 18563 for Ultrasonic Phased-Array Systems at the Manufacturer	3818
<i>J. Büchler, U. Schlengermann</i>	
Porosity – ‘The Good, the Bad and the Ugly’ of Radiographic Testing	3825
<i>H. Vaughan</i>	
A New Characterization Procedure for Computed Radiography Performance Levels Based on EPS, SNR and Basic Spatial Resolution Measurements	3830
<i>U. Ewert, U. Zscherpel, S. Bür</i>	
MAIzfp – A Joint Research Effort on NDT of Fiber Reinforced Composites within the Leading Edge Cluster MAI Carbon	3838
<i>M. Sause, R. Stössel, R. Oster, R. Söhnchen, P. Jahnke, A. Seemann, M. Goldammer, C. U. Grosse</i>	

Comparison of NDT Techniques to Evaluate CFRP - Results Obtained in a MAIzfp Round Robin Test	3846
C. U. Grosse, M. Goldammer, J.-C. Grager, G. Heichler, P. Jahnke, P. Jatzlau, D. Kiefel, M. Mosch, R. Oster, M. Sause, R. Stöbel, M. Ulrich	
Numerical Modeling of Ultrasonic Inspection in Fiber Reinforced Materials with Explicit Microstructure	3857
A.-M. Zelenyak, R. Oster, M. Mosch, P. Jahnke, M. Sause	
Ultrasonic Imaging of Carbon Fiber-Reinforced Plastics Using the Full Matrix Capture Data Acquisition Technique	3865
J.-C. Grager, M. Schrapp, H. Mooshofer, M. Sause, A.-M. Zelenyak, C. U. Grosse	
Combined Acoustic Emission and Thermographic Testing of Fibre Composites.....	3876
M. Goldammer, M. Sause, D. Rieger	
Damage Detection and Healing Performance Monitoring using Embedded Piezoelectric Transducers in Large- Scale Concrete Structures.....	3884
G. Karaikos, E. Tsangouri, D. G. Aggelis, K. Van Tittelboom, N. De Belie, D. Van Hemelrijck	
Lamb Wave Interactions in CFRP Plates.....	3892
G. Mook, J. Pohl, Y. Simonin	
A Novel Piezoelectric Fibre Patch Transducer for Shear Horizontal Wave Modes	3901
B. Köhler, T. Gaul, F. Schubert, U. Lieske	
Flexible Transducers for Guided Wave Structural Health Monitoring of Porous Composite Plates	3909
C.-C. Yin, C.-W. Chiu, W.-C. Tsai, J.-S. Chen	
Statistical Recognition of Structural Health in Composites through Ultrasonic Testing.....	3917
V. Memmolo, F. Ricci, N. D. Boffa, L. Maio, E. Monaco	
Vertical Eddy Current Method for Nondestructive Testing of CFRP	3926
Z. Zeng, S. Jiao, P. Wang, F. Du, J. Li	
Forced Magnetic Field Leakage (FMFL) – A new Approach to Non-Destructive Detection of Embedded Ferromagnetic Materials in Non-Magnetic Hosts.....	3927
E. Ahmad, C.-W. Liang, E. Balaban, M. Missous	
Recent Advancements in Lorentz Force Eddy Current Testing	3935
R. Schmidt, K. Weise, M. Carlstedt, M. Ziolkowski, H. Brauer, S. Gorges	
A New Pattern of Acoustic Delay-Line Based on Wedge Wave	3943
C.-H. Yang, P.-H. Tung, S.-C. Tai	

VOLUME 7

Wood Adhesives for Non-Destructive Structural Monitoring.....	3951
C. Winkler, U. Schwarz	
Improvement of the Quality of Large Size ERW Pipes and their Nondestructive Testing to Use in High Pressure Oil and Gas Pipelines	3959
M. Ghaemi	
Internal Inspection of Flow Coating Pipelines	3961
I. Artemyev, A. Kovalenko, Z. Klyuev, B. Artemiev	
A Novel Non Destructive Technology for Pipe Grade Determination and MAOP/Design Pressure Validation of Operating Pipelines	3977
T. Eiken, W. Thale	
Innovation in 3D Scanning Technology and Software is Pushing the Limits of Complex Corrosion and Mechanical Damage Assessment on Pipelines.....	3987
C. Piron, J.-A. Lavoie, J. Beaumont	
UT Camera for Rapid Quantitative Inspection Performing Multi-Modal Compression and Shear Wave Imaging.....	3996
B. Lasser, D. Rich, J. Kula, O. Mallaug	
Combining Analytical and Monte Carlo Modelling for Industrial Radiology	3998
C. Bellon, G.-R. Jaenisch, A. Deresch	
Transducer-to-Transducer Communication in Guided Wave Based Structural Health Monitoring	4007
J. Moll, L. De Marchi, A. Marzani	
Study of PA-TOFD Inspection based on Numerical Simulation	4015
S. Zhang, L. Liu, D. Zhang, H. Yang, Y. Fang, D. Kang, S. Jin, K. Zhang, Z. Luo, L. Lin	
Ray Tracing Boundary Value Problems: Simulation and SAFT Reconstruction for Ultrasonic Testing	4021
S. Götschel, C. Höhne, S. Kolkoori, S. Mitzscherling, J. Prager, M. Weiser	
Simulation of Ultrasonic Inspections of Composite Structures in the CIVA Software Platform.....	4029
K. Jezzine, D. Ségur, R. Ecault, N. Dominguez	
Ultrasonic Phased Array Evaluation of the Integrity of Polyethylene Piping Systems	4037
D. Gueugnaut, R. Bouaffre, A. Lopitaloux, R. Renaud, F. Angelini, P. Louet	
Nonlinear Ultrasonic Response of TATB-Based Polymer Bonded Explosive Under Compression Fatigue Loading	4056
Z.-F. Yang, Y. Tian, H.-Q. Zhou, Y. Xu, W.-B. Zhang, J. Li	
Weld Line Characterisation Using Various Contact and Non-Contact Ultrasound Techniques.....	4064
P. Fey, A. Geyer, M. Kreutzbrück	
Characterization of Polymer-based Materials Using Fluorescence Method and Fractal Analysis.....	4074
T. Chapnyi, N. Beschchasnaya, J. Schreiber, J. Opitz	
Talbot-Lau Grating Interferometry XCT for the Quantitative Characterization of Damage in Polymers After Impact and Static Tensile Testing.....	4082
S. Senck, D. Salaberger, C. Gusenbauer, B. Plank, G. Rao, J. Kastner	

Defect Recognition and Strength Evaluation of Dissimilar Diffusion Bonding Based on Support Vector Machine	4090
<i>Y. Luan, T. Gang, C. Zhang</i>	
Field Deployable Digital X-Ray for Weld Inspection in Oil & Gas	4100
<i>S. Wissels, P. Willems</i>	
Maximized Reliability of Testing Results of Mixed Materials Weld, Through the Combination of Eddy Current Testing with Phased Array Ultrasonic Testing in the Confined Environment of Power Station Header Nipples	4101
<i>T. Hartman, J. Keil, U. Carstensen, A. Schmidt</i>	
Automated Inspection of Welds with Limited Access by Use of Active Thermography with Laser Line Excitation	4108
<i>A. Runnemalm, P. Broberg, A. García De La Yedra, R. Fuente, A. M. Beizama, E. Fernández, N. Thorpe, P. Henrikson</i>	
Australian Innovations in Structural Health Monitoring for Aeronautical and Maritime Applications	4115
<i>C. M. Scala</i>	
Development of In-situ Ultrasonic Inspection of Offshore Mooring Chains	4123
<i>C. Nagaswaran, M. Ozarowska, J. Rudlin</i>	
Practical System for Monitoring Current Stress and Accumulated Fatigue of Vessel Hull using Nondestructive Method, by Measuring Magnetic Properties of the Metal, the Coercive Force	4125
<i>G. Bezlyudko, O. Zavalniuk, V. Nesterenko, R. Solomakha</i>	
Surface, Near-Surface and Volume Inspection of Cast Components Using Complementary NDT Approaches	4127
<i>M. Spies, H. Rieder, M. Rauhut, P. Kreier</i>	
THz Pulsed Time Domain Imaging Applied to Museum Objects and its Comparison with other Frequency Regions	4135
<i>K. Fukunaga, Y. Kohdzhuma</i>	
NDT at Historic Churches and Castles with Radar, Drilling-Resistance and Ultrasonic Echo Technique	4143
<i>A. Hasenstab</i>	
Fatigue Crack Detection on Unique Church Bells by Modal Analysis	4144
<i>A. Rupp, M. Plitzner</i>	
An XXL-CT-scan of an XXL Tyrannosaurus Rex Skull	4152
<i>N. Reims, A. Schulp, M. Böhnel, P. Larson</i>	
Non Contact High Precision Distance Measurement Using Single Probe Ultrasonic Transducer	4161
<i>M. Ramankutty, D. Kumar Kokkoden, S. Prasanna Sudhakaran, B. Chambalon, N. Mathew</i>	
Inline Production Monitoring by Cascading Radiographic and Computed Tomography Techniques	4169
<i>T. Stocker, S. Oeckl, M. Eberhorn</i>	
Physical and Technical Boundary Conditions for an Automated Industrial 3D-CT Inspection Dealing with Typical Production Cycle Times	4176
<i>S. Gondrom-Linke, T. Günther</i>	
In-Situ Observation of Bubble Formation in Neat Resin During the Curing Process by Means of X-Ray Computed Tomography	4178
<i>B. Plank, R. Helmus, M. Gschwandtner, R. M. Hinterholzl, J. Kastner</i>	
Applying Acoustic Pulse Reflectometry in Local Gas Distribution Networks	4186
<i>B. Lennox, K. Groves</i>	
Soil Saturation Detection from in Pipe Ultrasound Measurements	4188
<i>R. Collins, J. Zhu, R. Mills, J. Boxall</i>	
Remote Sensing of Free-Surface Flows with Arrays of Ultrasonic Sensors in Air	4197
<i>A. Nichols, G. Dolcetti, K. Horoshenkov, S. Tait</i>	
Robot Mapping and Localisation in Feature Sparse Water Pipes	4198
<i>M. Ke, J. Zhu, R. Mills, R. Dwyer-Joyce, J. Boxall, T. Dodd, R. Collins, S. Anderson</i>	
T-Sense - the New Generation of Non-contact Transmission Imaging with Non-ionizing Radiation	4200
<i>D. Nüßler, M. Schubert, S. Reible, S. Kose, T. Rosenthal, R. Salman, N. Pohl</i>	
Advances in Scanning X-ray Beam Imaging	4208
<i>M. Rommel</i>	
Digital Radiography for Cargo Inspection – Data Acquisition and Evaluation	4215
<i>T. Liithi, A. Flisch, M. Plamondon, D. Hardmeier, W. Visser</i>	
Electromagnetic Radiation of Terahertz Band	4222
<i>A. Efimov, V. Matveev, V. V. Klyuev</i>	
Real-time NDT of Automobile Bumpers with Millimeter-Wave Imaging Technology	4228
<i>S. S. Ahmed, A. Karamalis, T. Koeppel</i>	
Contact-free Control of Composites and their Manufacturing Processes by Ultrafast Pulsed THz Sensing	4237
<i>U. Schmidhammer, X. Neiers, P. Jeunesse</i>	
Fast Terahertz Volume Inspection for Industrial Process Control	4239
<i>B. Baccouche, A. Keil, M. Kahl, P. Haring Bolívar, T. Löfller, J. Jonuscheit, F. Friederich</i>	
Non-Contact Thickness Measurements with Terahertz Pulses	4240
<i>M. Yahyapour, N. Vieweg, T. Göbel, H. Roehle, A. Deninger</i>	
Choice of LDA vs. TDI (Time Delayed Integration) as DR Device for High Energy X-ray NDT	4248
<i>L. Yang, S. Li, N. Luu, J. Yang, D. Meng, C. Wang</i>	
Influence of X-Ray Focal Spot Orientation and High-Voltage on DR and CT Results	4250
<i>A. Lessmann</i>	
Practical Considerations and Effects of Metallic Screen Fluorescence and Backscatter Control in Gamma Computed Radiography	4252
<i>S. Mango</i>	
Influence of Scattered Radiation on the Efficiency of Dual-High Energy X-Ray Imaging for Material Characterization	4260
<i>S. Kolkori, G.-R. Jaenisch, A. Deresch</i>	

A Signal Enhancement Method for Magnetostrictive Guided Wave Testing of Pipeline Based on Mechanical Attachments	4270
<i>M. Cong, X. Wu, G. Shen</i>	
Guided Wave Testing (GWT) of High Temperature Piping	4278
<i>J. Fong, M. Evans</i>	
Corrosion and Defect Inspection of Inaccessible Components and Construction Parts with Long Range EMAT Technique	4285
<i>F. Niese, P. Jäckel</i>	
Application of the Ultrasonic Guided Wave for the Inspection of the Fuel Tank.....	4287
<i>A. Jankauskas, L. Mazeika, R. Kazys</i>	
Reconstruction Algorithms for Enhanced Imaging and Interpretation of Impact-Echo Data	4289
<i>D. Algernon, S. Feistkorn, M. Scherer</i>	
The Use of Acoustic Emission Method for Diagnosis of Damage of Pneumatic Cylinders	4290
<i>P. Mazal, F. Vlasic, H. Mahmoud, M. Jana</i>	
Heat Treatment and Tension Curves in Contemporary Steel Materials Monitored by Acoustic Emission	4300
<i>G. Por, P. Bereczki, B. Fekete, P. Trampus</i>	
Acoustic Emission Measurement During Low-Cycle Fatigue Test of Reactor Pressure Vessel Steels.....	4308
<i>G. Por, G. Csicsko, B. Fekete, P. Trampus</i>	
Monitoring of the Reactive Air Brazing by Acoustic Emission Analysis	4309
<i>R. Zielke, W. Tillmann, M. Kuck</i>	
The Detection of Different Stages of the Delaminating in the Pressure Vessels Shells by the Ultrasonic and Acoustic Emission Technique.....	4317
<i>K. Zотов, I. Растегаев, V. Гомера, V. Л. Соколов, V. П. Федоров, A. Смирнов</i>	
Traceable Characterization of Thermographic Cameras and Emissivity Measurements for Active Thermography	4333
<i>B. Gutschwager, A. Adibekyan, C. Monte, R. Kränchenhagen, C. Maierhofer</i>	
UV Testing Personnel Training and Certification.....	4335
<i>G. Batov</i>	
A Robot Inspection System Allows the Detection of Defects in Adhesive Bonds Between CFRP Components by Using Active Thermography, Leading to Reduces Cycle Times	4340
<i>M. Busch, B. Faupel</i>	
The Study on Thermal Characteristics According to the Liquid present Inside the Micro- Cracks of the Metal Specimen by using the Ultrasound Infrared Thermography	4347
<i>M. Choi, M. Choi, H. Park, J. Park, K. Kwon, W. Choi, W. Kim</i>	
Using the Correlation of Speckle Images to Monitor the Process of Crack Origination and Propagation under High-cycle Fatigue	4353
<i>E. Gorkunov, A. Vladimirov, S. Gladkovsky, S. Zadvorkin</i>	
Development of an Infrared Confocal Microscope for Axial Location of Hot Spots in a Multi-wafer Stacked Semiconductor Structure	4361
<i>H. Hur, K.-S. Lee</i>	
Structured Parameter Sets for Thermographic Inspection of CFRP Metal Hybrid Components	4362
<i>M. Jelinek, J. Glasschröder, G. Reinhart</i>	
Thermal Characteristic and Failure Analysis of Fully Packaged Devices Using Lock-in Thermography	4371
<i>S. Kim, K.-S. Lee, H. Hur, G.-H. Kim</i>	
Learning More on Thermoplastic Composites with Infrared Thermography	4372
<i>C. Meola, S. Boccardi, G. M. Carlonagno, G. Simeoli, P. Russo</i>	
Active Thermography for Crack Testing of Railway Wheels and Rails	4380
<i>A. Ehlen, M. Finckbohner, S. Lugin, U. Netzelmann, B. Valeske</i>	
Application of Object Recognition in Locomotive Components Monitoring	4382
<i>L. Xie, K. Yang, J. Peng, X. Gao, Y. Tan</i>	
Active Thermographic Testing of CFRP with Ultrasonic and Flash Light Activation	4390
<i>J. Pohl</i>	
Automated Non-destructive Testing of Hybrid Structures.....	4400
<i>K. Dröder, F. Dietrich, A. Fricke, C. Gerhard, M. Schäfer</i>	
Measuring Strand Orientation in Carbon Fiber Reinforced Plastics (CFRP) with Polarization	4404
<i>M. Schöberl, K. Kasnaki, A. Nowak</i>	
Time is Money and Image is Everything – The Changing Face of the RVI Market	4412
<i>T. Williams, K. Hammerl</i>	
Combination of Ultrasonic and Eddy Current Testing with Imaging for Characterization of Rolling Contact Fatigue	4422
<i>T. Szugs, A. Krüger, G. Jansen, B. Belitman, S. Gao, H. Mühlmel, R. Ahlbrink</i>	
Tightening Control by Ultrasound	4430
<i>F. Belahcene, P. Samson</i>	
Characterization of the States of Aging of HP Austenitic Stainless Steels Through Spectral Analysis of Ultrasonic Signals	4439
<i>N. Chaves De Siqueira, P. Duarte De Almeida, A. Mauricio Ferreira Leite Miranda De Sá, L. Henrique De Almeida, G. Ribeiro Pereira</i>	
Study of the Phase Contrast for the Characterization of the Surface of the Laser Megajoule Microshell	4446
<i>A. Choux, V. Dutto, E. Busvelle, J. P. Gauthier</i>	
Latest Improvements on Characterization for the LMJ Targets Fabrication	4455
<i>A. Choux, C. Hermerel, L. Reverdy, O. Raphaël, E. Busvelle, L. Jeannot, M. Theobald</i>	

Some NDT Approaches on Industrial Bonding Trying to Quantify its Quality	4463
<i>M. Ducousso, J.-M. Morvan, T. Bergara, C. Cuminatto, J. Jumel</i>	
Effect of Initial Stress-strain States on the Magnetic Behavior of Pipe Steels under Elastic Deformation	4464
<i>E. Gorkunov, Y. Subachev, A. Povolotskaya, S. Zadvorkin</i>	
Magnetic Methods as Applied to Testing a Current State of Welded Joints	4471
<i>E. Gorkunov, E. Putilova, S. Zadvorkin</i>	
Detection of Sensitization for 600 Alloy and Austenitic Stainless Steel by Magnetic Field Sensor	4479
<i>H. Kikuchi, H. Yanagisawa, H. Takahashi, T. Sumimoto, T. Murakami</i>	
Development of Simultaneous Nondestructive Evaluation using Magnetic Method for Material Characterization and Micro Defect	4486
<i>H. Kikuchi, S. Nakai, K. Sato, I. Shimizu, K. Iwata</i>	
Reference Block Design for High Resolution Ultrasound Immersion Tank Testing	4492
<i>D. Kotschate, D. Gohlke, M. Eisentraut</i>	
Quality Control of the Induction Hardened Layer and the Grinding Process in Aerospace Ball Screws Via Magnetic Barkhausen Noise Analysis	4496
<i>K. Guruchaga, A. Martínez-De-Gueren, A. Lasosa, F. Arizti</i>	
Qness - Hardness Testing	4504
<i>H. H. Hiegelsberger, V. Meyer</i>	
Nondestructive Testing of Material Properties and Defects in Hot Stamped Parts	4505
<i>T. Müller, B. Wolter, R. Kern, C. Conrad, T. Lambert, A. Haas, F. Niese, M. Bastuck</i>	
Acoustic Emission Tests on Steel Samples with Different Increasing Calibrated Planar Defects. Different Behavior of Material Due to Increasing Stress. Interpretation of the Results in the Context of String Theory.	4506
<i>G. Nardoni, P. Nardoni, M. Bentoglio, L. Mattei</i>	
Time Efficient Nondestructive Characterization of Customized Magneto-optical Thin Layers for Industrial Use	4513
<i>M. Rabung, M. Kopp, K. Szielasko, M. Sheikh Amiri</i>	
Capabilities and Limitations of using the Residual Magnetic Field in NDT	4514
<i>M. Roskosz</i>	
Using Barkhausen Noise to Develop a Method of Hardness Measurement	4521
<i>M. Roskosz, K. Fryczowski</i>	
Calculation and Analysis the Magnetic Parameters of the Minors Hysteresis Loop for Steels from the Basic Magnetic Parameters	4528
<i>S. Sandomirski</i>	
Analysis of the Structural Sensitivity of the Permeability Steels	4536
<i>S. Sandomirski</i>	
Detection of Sigma Phase Duplex Stainless Steel for Non-Destructive Testing Magnetic Barkhausen Noise	4544
<i>É. Santos, L. Padovese</i>	
Evaluation of Traction and Compression Residual Stresses by Non-Destructive Ultrasound and Magnetic Barkhausen Noise Testing Methods	4545
<i>E. Santos, R. Souza, J. Feiteira, L. Padovese</i>	
Relations Among Ultrasonic Testing Results and Defect Characteristics and Material Properties of Laser Additive Manufacturing Titanium Alloy	4546
<i>Y. Shi, P. Yang, J. Liang, Z. Wang</i>	
Coercimetric Technological and Acceptance Testing of Welded Joints to Ensure their Useful Life as Exemplified By Butt Welding of Rail Joints, including Subsequent Operational Diagnostics	4554
<i>G. Bezlyudko, R. Solomakha, A. Lukina</i>	
Monitoring of Low Cycle Fatigue Damage with Eddy Current	4559
<i>M. Porthoff, J. Peterseim, W. Thale</i>	
Distortion Analysis of Magnetic Excitation (DAME) – A Novel NDE Method for Evaluation of Properties of Ferromagnetic Materials	4568
<i>M. Vaidhianathasamy</i>	
Supercomputing the Cascade Processes of Radiation Transport	4576
<i>M. Zhukovskiy, M. Markov, S. Podolyako, R. Uskov, C. Bellon, G.-R. Jaenisch</i>	
Contemporary Witnesses for the Forensic Analysis of the 14th and 15th Century Fingerprints on Town Seals Examined by Latest Micro-CT Technology. Sphragistics in Combination with NDT	4582
<i>K. U. Berg, H. W. Berg</i>	
Advances in High Energy X-ray Digital Detector Arrays	4589
<i>C. Bueno, W. Ross, J. Shaw, J. Salisbury, E. J. Nieters, F. Hopkins, C. Lester, M. Osterlitz, D. Albagli, D. Castleberry, W. Girms</i>	
A Comparative Study of Performance Testing for Domestic Flat Panel Detector	4598
<i>H. Chen, Y. Li, D. Hu, T. Wang</i>	
Transfer of Technology as a Panacea to Indigenous Technological Development	4605
<i>H. Chimezie</i>	

VOLUME 8

Inner Stress and Strain Analysis of Granular Material by Compression Molding Using Micro-tomography	4608
<i>B. Dai, Y. Tian, W.-B. Zhang, L.-G. Lan</i>	
Relationship between Image Plates Physical Structure and Quality of Digital Radiographic Images in Weld Inspections	4618
<i>D. Ferreira De Oliveira, A. S. S. Silva, A. S. Machado, C. S. Gomes, J. R. Nascimento, R. T. Lopes</i>	

Research on Defect Depth Measurement Algorithm In Digital Radiography Testing	4632
<i>W. Guo, Y. Chen</i>	
Nondestructive Extraction of Fiber Orientation in Composites from CT-Scan: A Comparative Study	4638
<i>P. Latil, M. Trlin, O. Guiraud, A. Sonzogni, B. Fayard, B. Hesse</i>	
Static and Dynamic In-situ-computed-tomography for Dimensional Metrology Applications	4640
<i>P. Hornberger, S. Rettenberger, A. Tissen</i>	
Fast X-ray Digital Radiography Equipment for In-line Production Control	4641
<i>M. Iovea, M. Neagu, B. Stefanescu, G. Mateiasi, I. Porosnicu, E. Angheluta</i>	
Novel Radiographic Testing to Analyze the Porosity and Water Absorption of Bricks	4642
<i>A. Jayatilaka, V. Sivahar, S. Amarashsinghe, N. Thilavala</i>	
Gamma-Radiography: State of the Art or Unjustified Activity?	4650
<i>C. Kaps, A. Steege, B. Söller</i>	
Assessment of Measurement Uncertainty due to Geometrical Misalignments of a CT System	4651
<i>M. Ferrucci, E. Ametova, W. Dewulf</i>	
Statistical Methods of an Assessment of Coherence of Experts Opinions in Interpretation of Radiogram	4653
<i>N. Alyeshin, D. Galkin, N. Krysko</i>	
Study on Girth Welding Once-through Penetration Length in Radiography	4664
<i>L. Liang, D. Li</i>	
Dimensional Measurement of Nuclear Fuel Pellets using High Energy X-ray CT	4670
<i>K. Yamaguchi, Y. Ohtake, H. Suzuki, Y. Nagai, A. Ishimi, K. Katsuyama</i>	
Highly-Sensitive Digital Fluoroscopy Systems for Non-destructive Testing	4677
<i>S. Mikhailov, V. Troitskiy, R. Pastovenskiy, Y. Udovenko</i>	
Experience of Tangential Radiographic Inspection Application for Nuclear Power Facilities	4685
<i>V. Troitskiy, M. Karmanov, S. Mikhailov, R. Pastovenskiy</i>	
Perspectives of Development of Radiation Testing of Welded Joints	4691
<i>V. Troitskiy</i>	
Good Practice Guide to Dark Room Operations	4699
<i>H. Vaughan</i>	
Development of a Tangential Neutron Radiography System for Monitoring the Fatigue Cracks in Hydrogen Fuel Tanks	4702
<i>M. Vieyra, M. Iovea, K. Tzortzatou</i>	
The Application of 3D Printing and ICT Technology in Structure Research	4713
<i>Y. Xiao, S. Wan, F. Wang, Y. Li</i>	
Study of High Energy X-ray Tomography Experiment Method for Explosive Inner Defect and Density Distribution Testing	4718
<i>C. F. Yang</i>	
Recognition and Measurement of Small Defects in ICT Testing	4719
<i>G. Zhimin, N. Peijun, Z. Weiguo, Q. Zicheng</i>	
A Comparative Study of Eddy Current Test Signals from EDM Notches and Fatigue Cracks in TiAl4V Plates	4725
<i>Y.-J. Kim, Y.-G. Kim, D.-J. Yoon, W. Choi, B. Ahn</i>	
Safety and Productivity Innovations in Liquid Penetrants and Magnetic Particles Testing	4726
<i>M. Cevenini</i>	
Inspection of Clad Materials Using Massive Multi-Frequency Excitation and Spectrogram Eddy Current Method	4733
<i>T. Chady</i>	
Development of a System to Corrosion Detection Using Pulsed Eddy Current	4740
<i>C. B. Fagundes Do Carmo, M. Rebello, Y. Santos, E. Simas Filho, I. Silva, C. Farias</i>	
Well Integrity and Corrosion Inspection of Surface Casings and Conductors of Offshore Wells with the D-PEC Inspection Technology	4748
<i>F. Gabriels</i>	
Investigation on Features of Alternating Electromagnetic Field for Perpendicular and Parallel Cracks Detection	4752
<i>J. Ge, W. Li, G. Chen, X. Yuan, Y. Wu</i>	
Motion-induced Eddy Current Testing of Composite Materials	4759
<i>S. Gorges, H. Brauer, M. Ziolkowski, M. Carlstedt, K. Weise, R. Schmidt, J. Mengelkamp</i>	
Investigation of Suspended Sediment Properties Based on Scholte Wave	4768
<i>Q. Han, L. Qi, X. Jiang, Z. Tong, Y. Zhang, C. Zhu</i>	
Various Approaches to Obtain an Eddy Current Signal in Case of Overheating	4777
<i>K. Härtel, A. Zösch, M. Seidel, C. Seidel</i>	
About the Performance of Non-Multiplication Magnetization Method in a Magnetic Particle Testing	4782
<i>M. Hori, A. Kasahara</i>	
Eddy Current Array and Liquid Penetrant Testing Contrast Testing on Austenite Stainless Steel Piping	4790
<i>Y. Li, B. Hu, W. Liu, B. Wan</i>	
Measurements of the Extension of the Magnetite Piles on Steam Generator Tubing with Eddy Current Techniques	4798
<i>T. Jäppinen, S. Ala-Kleme</i>	
Demagnetization of Thick Walled Pipes	4806
<i>T. Orth, M. Kaack, R. Peters, S. Nitsche</i>	
Water Tightness from a Leak Detection Point of View	4807
<i>R. Konwitschny</i>	
Identification of the Fatigue Cracking of the Aluminide Layers on the Nickel Alloy with the Application of the Optical Method ESPI and Eddy Current Method	4813
<i>D. Kukla, J. Szlagowska-Spsychalska</i>	

Magnetic Particle Testing using Cross- and Additional Orthogonal Magnetic Coils - Application in Components of Large Dimensions	4820
<i>R. Link, N. Riess</i>	
Imaging of Local Defects of Pipes Based on Deconvolution Technology	4828
<i>Q. Luo, Y. Shi, Z. Wang, W. Zhang, Y. Zhang</i>	
Improvement of the Eddy Current Method of Non-Destructive Testing with Pulsed Mode Excitation	4836
<i>O. Dugin, Y. Kuts, I. Lysenko, A. Protasov</i>	
B-H Curves Approximations for Modelling Outputs of Non-Destructive Electromagnetic Instruments	4844
<i>P. Meilland, P. Lombard, C. Reboud, A. Skarlatos, T. Svaton, A. Martinez-De-Guerenu, S. Labb��, M. Stolzenberg</i>	
A Pedestrian and Vehicle-Mounted System for Detecting RCF in Rail using Eddy Currents	4846
<i>S. Saunders, R. Crocker</i>	
Non-destructive Research of the Friction Surface of the Brake Discs in the Aspect of Evaluation of the Braking Process	4855
<i>W. Sawczuk, J. Kowalczyk, D. Ulbrich, S. Kolodziejki</i>	
Vacuum Tests of a Very Large Component: The Final Test Cryostat System for the ITER Central Solenoid Modules	4863
<i>H. Scheller, K. Schaubel, B. Schrauth, J. Smith, E. Theisen, W. Walter, R. Wolf</i>	
Automated Monitoring System for Big Diameter Ropes	4871
<i>D. Slesarev, I. Shpakov</i>	
Scanning Magnetization Devices	4872
<i>V. Troitskiy</i>	
Eddy Current Multi-Channel Module for In-line High-speed Inspection of Railroad Rails	4880
<i>A. Opanasenko, A. Iurchenko, G. Lutsenko, V. Uchanin</i>	
PROMPRYLADE Family of Eddy Current Flaw Detectors – From Simple to More Complicated	4887
<i>V. Uchanin, G. Lutsenko, A. Opanasenko, A. Dzhaganian</i>	
Nondestructive Testing Systems with Magnetic Flux Leakage (MFL)	4895
<i>S. Youssef, K. Szielasko, J. H. Kurz, R. Tschuncky</i>	
Handheld Terahertz Inspection and Thickness Measurements	4896
<i>S. Becker, A. Keil, H. Nolting</i>	
Multi-source Inspection of Fiber-reinforced Materials	4898
<i>T. Chady, K. Goracy</i>	
Nondestructive Testing to Accurately Measure Multilayer Coating Thickness using Time Domain Terahertz Technology	4906
<i>D. Zimdars, J. White, J. Calzada, B. Foos</i>	
Terahertz Technology Approaches the Markets: Survey About the Current Developments	4908
<i>S. Kremling, T. Hochrein</i>	
Monitoring of Drying of Cement Screed with the Help of Ultra-wideband Microwaves and Air-coupled Antennas	4919
<i>M. Manavipour, C. Sklarczyk, K. Szielasko</i>	
Interpretation of Ultrasonic Based Stave Thickness Measurement Technique for Blast Furnaces	4926
<i>S. Balamurugan, S. S. Rajendran, S. S. Indimath, M. Dutta, M. Patra, U. Singh</i>	
Elastic Moduli Measurements at Elevated Temperatures using Ultrasonic Waveguide Embodiments	4927
<i>S. Periyannan, K. Balasubramanian</i>	
Development System to Adjust Defined Stress and Strain in Bolts Up to M36 with Ultrasonic Stress Evaluation	4935
<i>M. Becker</i>	
Local Evaluation of Stress States in Complex Geometries using Ultrasonic Runtime Measurement	4936
<i>M. Becker</i>	
Ultrasonic Testing of Dissimilar Metal Joints Present in Divertor Plasma Facing Components	4938
<i>K. S. Bhopre, M. Mehta, S. Khirwadkar</i>	
Development, Characterization and NDT Use of Air-Coupled Capacitive Ultrasonic Transducers	4940
<i>C. Bateau, M. R��nier, M. Castaings</i>	
Innovative Technologies for Ultrasonic Phased Array Instrumentation	4942
<i>J. B��chler, S. Falter</i>	
Advanced and Fast Reconstruction Methods for Ultrasonic Imaging	4943
<i>E. Carcreff, M. Gruber, G. Dao, D. Braconnier</i>	
Research on Ultrasonic Inspection of the Narrow gap welds of the Main Coolant Line (MCL) in Chinese Evolutionary Pressurized Reactor (CEPR) Nuclear Power Plant	4944
<i>L. Zhou, M. Li, H. Chen, G. Ma, W. Wang</i>	
An Improve Denosing Method for Defect Detection in TOFD Collected Data	4952
<i>D. Chi, T. Gang</i>	
A Development of an Array Ultrasonic Guided Wave Inspection System and Focusing Technique for CUI Inspection of Long Range Pipe	4960
<i>H. Cho, D. H. Lee, T. Kang, D. Park</i>	
Support Vector Machines Applied to the Identification of Carburized HP Steels Using Ultrasonic Non-Destructive Testing	4961
<i>C. B. Fagundes Do Carmo, L. Rodrigues, F. Cruz, E. Simas Filho, M. Albuquerque, I. Silva, C. Farias</i>	
Ultrasonic Phased Array System with 128 Full Parallel Channels (128:128) for Fast and Modular Automated Testing	4968
<i>S. Heilmann, C. Richter, H. Funke, O. Von Kopp, H. Heuer</i>	
High Frequency Ultrasonic Systems with Frequency Ranges of 35 to 200 MHz	4970
<i>W. Hillger, L. B��hling, D. Ilse</i>	

Study on Sectorial Scan Angle Range for Phased Array Ultrasonic Testing in Standard Setting	4978
<i>X. Jiang, Q. Han, H. Zheng, G. Tian, P. Wang</i>	
Determination of Crack Tip Location by Using Tip Diffraction and Geometric Calculation	4984
<i>Y.-G. Kim, N. S. Jo, D.-J. Yoon, B. Ahn</i>	
EMAT in Car and Space Industry: Modern Achievements and Specifics of Application	4991
<i>A. Kirikov, F. Durnov</i>	
Inspection of Hidden and Curved Regions in Composite Structures using Non-contact Guided Ultrasonic Waves	4993
<i>D. Koodalil, K. Balasubramanian</i>	
Customized Ultrasonic Inspection Solutions for Various Industrial Products	5000
<i>M. Britzger, G. Vogt, B. Vogt</i>	
A Study on the Focusing Characteristics of Ultrasonic Guided Waves using Finite Element Analysis	5005
<i>D. H. Lee, U. Lee, Y.-S. Huh, B. Kim, Y. Lee, K. D. Park</i>	
Ultrasonic Inspection of Small Pores Within Electron Beam Welded Titanium Alloys and Their Influence on the Fatigue Properties	5007
<i>J. Liang, Z. Sha, Y. Shi</i>	
Ultrasonic Method for Determining the Thickness of TBC Deposited on Metal	5016
<i>Z. Ma, W. Zhang, Z. Luo, S. Jin, L. Lin, M. Lei</i>	
COBRI – A Rolling Ultrasonic 3D Scanner for NDT of Concrete	5017
<i>F. Melandso, W. Bjerke, K. Chapagain, S. Lapshin, T. Melandso</i>	
Application of Ultrasonic Methods for Manufacture of Pipelines and Maintenance	5018
<i>M. Mihovski, P. Chukachev, Y. Mirchev, V. Sergienko</i>	
Ultrasonic Testing for General Corrosion of Metals and Alloys	5025
<i>Y. Mirchev</i>	
The Nondestructive Evaluation and Experimental Research on Bolt Stress by Ultrasonic Wave	5036
<i>Q. Pan, Y. Mi, S. Liu, D. Xiao, C. Xu</i>	
Ultrasound Phased Array Imaging on Curved Surface for Weld Inspection of Elbow Pipe as a Replacement for Radiographic Inspection	5037
<i>C.-S. Park, J. K. Park, W. Choi, S. Cho, E. S. Moon, M. J. Huh</i>	
Ultrasound Degassing and Computed Tomography Quality Control	5045
<i>T. Pabel, T. Petkov, D. Habe, P. Schumacher</i>	
A New Balanced TWM Laser Ultrasound Detector, the Principle and its Applications in NDT	5052
<i>B. Reitinger, S. Zamiri, T. Mitter, J. Roither, P. Burgholzer</i>	
Development and Validation of an Iterative Time Reversal Technique for the Inspection of Composite Structures	5053
<i>D. Richard, G. Maes</i>	
Evaluation of Adhesion of Concrete Screed to Mine Shaft Wall by Means of Nondestructive Acoustic Methods	5054
<i>J. Hola, K. Schabowicz, L. Sadowski</i>	
On Determination of Focal Laws for Linear Phased Array Probes as to the Active and Passive Element Size	5061
<i>A. Gommlich, F. Schubert</i>	
Operation and Sound Field of an Ultrasonic Biplane Array	5069
<i>R. Hipp, A. Gommlich, D. Joneit, F. Schubert, H. Heuer</i>	
Laser Ultrasound Investigations on Composites with Optical Generation from Visible to Infrared	5076
<i>R. Seyrkammer, S. Zamiri, B. Reitinger, R. Galos, C. Hofer, P. Burgholzer</i>	
The Simulation-Assisted Designing of Focal Laws for Annular Phased Array Multi-zoned Inspection of Disks	5083
<i>Z. Sha</i>	
The Progressive Statistical Analysis Results of Performance Demonstration for Piping Welds	5084
<i>H.-F. Shyu, Y.-T. Liao</i>	
Studies of Metal-Rubber Suspension Components of a Motor Vehicle by Ultrasonic Method	5091
<i>D. Ulbrich, J. Kowalczyk, W. Sawczuk, S. Kolodziejczyk, J. Selech</i>	
PROline – Ready for the Next Industrial Revolution (Industry 4.0) and SCADA	5098
<i>G. Vogt</i>	
New Possibilities in Ultrasound Phased Array Testing by the Use of Biplanar Array Technology	5104
<i>T. Herzog, S. Walter, F. Schubert, H. Heuer</i>	
A Wave Propagation Model for Simultaneous Determination of Thickness and Sound Velocity of Layered Structures	5105
<i>M. Wolf, S. Kümmritz, E. Kühncke</i>	
PoD Analysis of Phased Array and Conventional Ultrasonic Techniques	5114
<i>M. Yalçın, H. I. Yelbay, C. H. Gür</i>	
An Innovative Scanning Solution for Corrosion Mapping	5122
<i>F. Zottig, P. Tremblay, L. Enenkel</i>	
Organizational Negligence and How to Avoid it	5123
<i>R. Alijah</i>	
How to Assure Compliance of Health, Safety and Environmental Issues to Customers?	5124
<i>R. Alijah</i>	
Scanning From Heating: 3D Digitization and NDT	5125
<i>M. Belkacemi, O. Aubreton, C. Stoltz</i>	
Determination of Biomass in Biotechnological Processes by Laser-Speckle-Photometry	5126
<i>B. Bendjus, U. Cikalova, C. Schott, J. Steingroewer, T. Bley, T. Werner</i>	
Ultra Sniffer – New Leak Detection Method	5131
<i>R. Brockmann</i>	

Manufacturing of Reference Defects for NDT Using Low-Energy EDM	5133
<i>R. Casperson, A. Knöppchen, R. Pohl, L. Zimme, J. Bode, M. Hollesch</i>	
Comparison of Non-Destructive and Destructive Examinations in Today's Inspection Practices	5143
<i>G. Aire, H. Chimezie</i>	
A Reliable and Tracer Gas Independent Leak Detector for Food Packages	5148
<i>S. Decker</i>	
What Makes a Good NDT Online Exhibition	5157
<i>R. Diederichs</i>	
Technical Diagnostics - The Basis of Safety of Industrial Installations	5158
<i>A. Efimov, V. V. Klyuev, N. Kuzelev</i>	
Balancing Productivity and Product Quality in Welding, Revealing Interacting Organisational Cornerstones	5164
<i>A. Ericson Öberg, P. Hammersberg</i>	
Future of Nondestructive Testing	5166
<i>N. Jain</i>	
NDT Practical Examinations / Assessments / Evaluations	5168
<i>H. Jansen</i>	
Evaluation of the Probability of Detection Effect by Steam Generator Chemical Cleaning	5173
<i>K. Joo, D. Shin, Y. Kang, K. Shin</i>	
Non-destructive Testing of Galvanic Coatings on Parts of Liquid Rocket Engines	5179
<i>V. Kaloshin, A. Kren, A. Smirnov, A. Machikhin, P. Levochkin</i>	
The Modular Concept of Training, Advanced Training and Certification Personnel NDT for Rail Transport Russia	5188
<i>V. Konshina, G. Dymkin</i>	
Using Adaptive Filtration in Digital Magnetodynamic Signal Processing	5192
<i>D. Kosobokov, G. Dymkin, V. Churova</i>	
CURe MODERN - French-German Infrastructure Inspection, Urban and Regional Planning	5197
<i>J. H. Kurz, R. M. Moryson, D. Prybyla, C. Chassard, T. Wundsam, J.-P. Exner</i>	
Leak Test of Test Parts with Pressure Compensation Elements Using the Test Medium Compressed Air	5209
<i>J. Lapsien</i>	
Using Hilbert Transform for Signal Processing in Mechanical Impedance Analysis	5215
<i>V. Eremenko, I. Lysenko, A. Protasov, E. Suslov</i>	
The Real-Time Quantitative and Display Method for Incomplete Defect MFL Signals	5223
<i>L. Peng, S. Huang, W. Zhao, S. Wang</i>	
Non-destructive Tests for Damage Analysis	5233
<i>R. Schaar</i>	
Helium Leak Testing of Dangerous Goods Packagings	5235
<i>E. Schlick-Hasper, O. Seidler, T. Goedecke, M. Kraume</i>	
The Use of Non-Destructive Methods in Technical Assessment of Agricultural Machinery Under Field Conditions	5245
<i>J. Selech, J. Kowalczyk, A. Stachowiak, D. Ulbrich, K. Włodarczyk, W. Sawczuk</i>	
Current Based Normalized Tripple Covariance As a Bearings Diagnostic Feature in Induction Motor	5251
<i>L. Swedrowski, T. Ciszewski, L. Gelman</i>	
Improvement of Quality of NDT Personnel Training: Opinion of Ukrainian Society for NDT	5259
<i>V. Troitskiy, A. Shekero, S. Shchupak</i>	
To What Extent May We Accept Manufacturing-related Microscopic Defects in Cast Steel?	5261
<i>I. Veile, A. Tempel, M. Weikert-Müller</i>	
Applications of Wireless Remote Collaboration for Nondestructive Testing	5262
<i>M. Domke, T. Ward</i>	
Quantitative Analysis of Moisture in Composites using an Ultrashort Echotime Sequence on a 3-Tesla Whole-Body MRI System	5263
<i>A. Zimmermann, P. Martirosian, F. Springer, F. Schick</i>	
Focus on the COFREND Working Group: "Alternative Methods and Techniques to Penetrant and Magnetic Particle Testing"	5265
<i>M. Taglione</i>	
Author Index	