

# **Insight, Non-Destructive Testing and Condition Monitoring**

## **incorporating the European Journal of NDT**

### **formerly the British Journal of Non-Destructive Testing**

**ISSN: 1354-2575**

## **VOLUME 51 2009 – INDEXES**

### **Key to issues**

No 1	January .....	1-56
No 2	February .....	57-112
No 3	March .....	113-176
No 4	April .....	177-232
No 5	May .....	233-296
No 6	June .....	297-352

No 7	July .....	353-408
No 8	August .....	409-464
No 9	September .....	465-528
No 10	October .....	529-584
No 11	November .....	585-640
No 12	December .....	641-696

### **REGULAR FEATURES AND SHORT TITLES**

Academia NDT International	
Meeting Reports .....	158, 473
Associate Members .....	56, 112, 176, 232, 296, 352, 408, 464, 528, 584, 640, 696
BINDT Awards .....	65, 121, 418
Comment .....	2, 58, 114, 178, 234, 298, 354, 410, 466, 530, 586, 642
Conference Reports	
The 17th World Conference on Non-Destructive Testing, Shanghai, China .....	156
NDT 2009, Blackpool, UK .....	621
Institute News .....	41, 64, 200, 419, 498, 538, 611
Institute Notices .....	309, 619
International Diary .....	42, 94, 160, 218, 280, 334, 393, 449, 512, 570, 625, 681
Letters to the Editor .....	306, 364
Membership .....	41, 64, 200, 302, 419, 498, 611
NDT Info .....	45, 99, 165, 222, 284, 339, 398, 452, 516, 573, 628, 684
Newsdesk .....	4, 60, 116, 180, 236, 300, 356, 412, 468, 532, 588, 644
Obituary	
Ray Firth .....	538
Product Showcase .....	52, 107, 173, 229, 293, 346, 405, 459, 424, 580, 635, 693
Company Profile	
The Validation Centre (TVC) Ltd .....	279
Special Features	
Condition Monitoring .....	409
Conference Papers .....	57
Electromagnetic Wave Phenomena Applied to NDT .....	297
Novel Applications .....	1
Optical Methods .....	233
Power Generation .....	641
The Rail Industry .....	353
Ultrasonics .....	585

Apeagyei A K (with Buttlar W G and Reis H)	
Assessment of low-temperature embrittlement of asphalt binders using an acoustic emission approach .....	129
Atkinson R (see Qingshan Shan) .....	442
Babu Rao C (see Pandian C) .....	568
Balasubramaniam K (see Chandrasekaran J) .....	606
Baldev Raj (see Pandian C) .....	568
Baldev Raj (see Satyanarayana L) .....	384
Banasiaik R (with Wajman R and Soleimani M)	
An efficient nodal Jacobian method for 3D electrical capacitance tomography image reconstruction .....	36
Barsanescu P (see Grimberg R) .....	25
Basak D	
Performance comparison of drive ropes in a cable belt conveyor system using an NDT technique .....	439
Behzad M (with AlandiHallaj A, Rohani Bastami A, Mba D, Eftekharnejad B and Charnley B)	
Defect size estimation in rolling element bearings using vibration time waveform .....	426
Benslimane R (see Maalmi K) .....	184
Blakeley B (see Papaelias M Ph) .....	366
Bo Liu (see Yunze He) .....	310
Bowler A I (see Drinkwater B W) .....	491
Brasche L (with Lopez R, Eisenmann D and Griffiths K)	
Engineering studies for fluorescent penetrant inspection with a focus on developer application methods .....	88
Bruma A (see Grimberg R) .....	25
Buckley J (with Servent R)	
Improvements in ultrasonic inspection of resistance spot welds .....	73
Bueno C (see Weimin Bai) .....	327
Burch S (see Wall M) .....	553
Burch S F (see Wall M) .....	612
Buttlar W G (see Apeagyei A K) .....	129
Byington C S (with Watson M J, Sheldon J S and Swerdon G M)	
Shaft coupling model-based prognostics enhanced by vibration diagnostics .....	420

### **AUTHOR INDEX**

Acosta D (see Obrutsky A) .....	499
Ahmadi H (with Mollazade K)	
Fault diagnosis of an electro-pump in a marine ship using vibration condition monitoring .....	431
Ahmadi H (see Mollazade K) .....	594
AlandiHallaj A (see Behzad M) .....	426
Albert R D (see Malglaise F) .....	66
Alimardani R (see Mollazade K) .....	594
Alleyne D N (with Vogt T and Cawley P)	
The choice of torsional or longitudinal excitation in guided wave pipe inspection .....	373
Amos M (see Jasiūnienė E) .....	477
Anto I (see Chandrasekaran J) .....	606

Calmon P (see Mahaut S).....	78
Carpentier C (see Nageswaran C).....	660
Cawley P (see Alleyne D N).....	373
Cawley P (see Milne K).....	378
Challis R E (see Smith R A).....	82
Chandrasekaran J (with Anto I, Balasubramaniam K and Venkataraman K S) Higher order modes cluster (HOMC) guided waves for online defect detection in annular plate region of above-ground storage tanks .....	606
Changlong Wang (see Fengzhu Ji).....	32
Changlong Wang (see Liangjin Lei).....	508
Charnley B (see Behzad M).....	426
Chatillon S (see Mahaut S).....	78
Darmon M (see Mahaut S).....	78
Davis C L (see Papaelias M Ph).....	366
Diamond G G (see Yin X).....	484
Drinkwater B W (with Bowler A I) Ultrasonic array inspection of the Clifton Suspension Bridge chain-links.....	491
Dunhill A (see Milne K).....	378
Dunhill T (see Virkkunen I).....	271
Edalati K (see Rokrok B).....	315
Eftekhanejad B (see Behzad M).....	426
EHara N (see Imamura K).....	12
Eisenmann D (see Brasche L).....	88
Fauvet E (see Maalmi K).....	184
Feilu Luo (see Yunze He).....	310
Fengzhu Ji (with Changlong Wang, Shiyu Sun and Weigu Wang) Application of 3-D FEM in the simulation analysis for MFL signals .....	32
Fengzhu Ji (see Liangjin Lei).....	508
Flores J V (see Jacques R C).....	504
Fromme P (see Masserey B).....	667
Fu R Z (see Ren S K).....	672
Galvão J C A (see Mendes R).....	654
Gandossi L (with Simola K and Shepherd B) The link between risk-informed in-service inspection and inspection qualification .....	16
Gandossi L (with Simola K) Activities on risk-informed in-service inspection within the ENIQ network .....	650
Gang Tie (see Shi Duanhu).....	257
Gao J M (see Shen Q M).....	541
Gao Xiaorong (see Salzburger H J).....	370
Garcia A (see Obrutsky A).....	499
de Geus K (see Mendes R).....	654
Glover I A (see Qingshan Shan).....	442
Godoi W C (see Mendes R).....	654
González A (see McGetrick P J).....	433
Griffiths K (see Brasche L).....	88
Grimberg R (with Savin A, Steigmann R, Bruma A and Barsanescu P) Ultrasound and eddy current data fusion for evaluation of carbon-epoxy composite delaminations .....	25
Grum J (see Kek T).....	124
Haddara M (see Khalifa M) .....	192
Haixia Shang (with Jianxin Gao) Theories and industrial applications of optical interferometric NDT techniques: A review .....	240
Hamzah A R (see Mohd Salleh K A) .....	321
Harvey G (with Jones J) Small turbine blade inspection using laser strain techniques.....	137
Hasse L (with Kiwilszo M, Smulko J and Stepinski T) Quality assessment of varistor ZnO structures by resonant ultrasound spectroscopy .....	262
Huang Chuan-hui (see Shi Duanhu) .....	257
Huicai Xie (see Runtao Zhan).....	151
Hutchins D A (see Yin X) .....	484
Imamura K (with Inada Y, Ehara N, Umetani K and Nakajima Y) Sensitive inspection of void defects using synchrotron refraction imaging with quantitative modelling of contrast enhancement .....	12
Inada Y (see Imamura K) .....	12
Jacques R C (with Flores J V, Strohaecker T R and Reguly A) Acoustic emission testing in wires from the tensile armour of flexible risers under load .....	504
Jasiūnienė E (with Raišutis R, Šliteris R, Voleičius A, Vladīšauskas A, Mitchard D and Amos M) NDT of wind turbine blades using adapted ultrasonic and radiographic techniques .....	477
Jaske C E (see Shannon B E) .....	207
Jayakumar T (see Pandian C) .....	568
Jayakumar T (see Satyanarayan L) .....	384
Jenson F (see Mahaut S) .....	78
Jianxin Gao (see Haixia Shang) .....	240
Jones J (see Harvey G) .....	137
Joukoski A (see Mendes R) .....	654
Junzhe Gao (see Yunze He) .....	310
Kasinathan M (see Pandian C) .....	568
Kek T (with Grum J) AE signals as laser cutting quality indicators .....	124
Kempainen M (see Virkkunen I) .....	271
Khalifa M (with Khan F and Haddara M) Optimal selection of non-destructive inspection technique for welded components .....	192
Khan F (see Khalifa M) .....	192
Kiwilszo M (see Hasse L) .....	262
Krishnamurthy C V (see Satyanarayan L) .....	384
Krishnan Balasubramaniam (see Satyanarayan L) .....	384
Lepistö T (see Santa-aho S) .....	212
Lew Yan Voon L F C (see Maalmi K) .....	184
Li C (see Shen Q M) .....	541
Li X L (see Ren S K) .....	672

Liangjin Lei (with Changlong Wang, Fengzhu Ji and Quanli Wang) <u>RBF-based compensation of velocity effects on MFL signals</u> .....	508
Lilley J (see Wall M) .....	553
Lilley J (see Wall M) .....	612
Lindgren M (see Santa-aho S) .....	212
Lopez R (see Brasche L) .....	88
Lugg M (see Papaelias M Ph) .....	366
Maalmi K (with Benslimane R, Lew Yan Voon L F C and Fauvet E) <u>Towards automatic analysis of ultrasonic time-of-flight diffraction data using genetic-based Inverse Hough Transform</u> .....	184
Mahaut S (with Darmon M, Chatillon S, Jenson F and Calmon P) <u>Recent advances and current trends of ultrasonic modelling in CIVA</u> .....	78
Malglaive F (with Albert R D) <u>Reverse geometry X-ray imaging</u> .....	66
Mandache C (see Zainal Abidin I) .....	69
Manoj Kumar Saxena (see Pandian C) .....	568
Martins C O D (with Reguly A) <u>Micromagnetic stress evaluation of flexible riser tensile armours</u> .....	8
Martins P (see Mendes R) .....	654
Masserey B (with Fromme P) <u>High-frequency guided waves for defect detection in stiffened plate structures</u> .....	667
Mba D (see Behzad M) .....	426
McGetrick P J (with González A and O'Brien E J) <u>Theoretical investigation of the use of a moving vehicle to identify bridge dynamic parameters</u> .....	433
Mendes R (with Portella K F, Godoi W C, Galvão J C A, Joukoski A, Martins P, Swinka-Filho V and de Geus K) <u>Determination of crushed stone volume in concrete cores from hydroelectric power plant dams by three-dimensional tomography</u> .....	654
Mienczakowski M J (see Smith R A) .....	82
Milne K (with Cawley P, Dunhill A and Wright D C) <u>Vibro-enhanced fluorescent penetrant inspection (FPI)</u> .....	378
Mitchard D (see Jasiūnienė E) .....	477
Mohammadzadeh N (see Rokrok B) .....	315
Mohd Salleh K A (with Hamzah A R and Wan Hassan W M S) <u>Modulation transfer function (MTF) and noise power spectrum (NPS) studies on three industrial digital radiography (IDR) systems</u> .....	321
Mollazade K (see Ahmadi H) .....	431
Mollazade K (with Ahmadi H, Omid M and Alimardani R) <u>An intelligent model based on data mining and fuzzy logic for fault diagnosis of external gear hydraulic pumps</u> .....	594
Morgan L L <u>Automated Ultrasonic Testing (AUT) – Qualifications and variations</u> .....	266
Movafeghi A (see Rokrok B) .....	315
Mukriz I (with Tian G Y and Yong Li) <u>3D transient magnetic field mapping for angular slots in aluminium</u> .....	21
Murali N (see Pandian C) .....	568
Nageswaran C (with Carpentier C and Tse Y Y) <u>Microstructural quantification, modelling and array ultrasonics to improve the inspection of austenitic welds</u> .....	660
Nakajima Y (see Imamura K) .....	12
Nelson L J (see Smith R A) .....	82
Norouzi E (with Ravanbod H) <u>Optimisation of the flux distribution in magnetic flux leakage testing</u> .....	563
O'Brien E J (see McGetrick P J) .....	433
Obrutsky A (with Acosta D, Garcia A and Scopelliti J) <u>Non-destructive testing methods used for the study of cultural heritage in Argentina</u> .....	499
Omid M (see Mollazade K) .....	594
Ostermeyer H (see Virkkunen I) .....	271
Pandian C (with Sosamma S, Kasinathan M, Babu Rao C, Murali N, Jayakumar T, Baldev Raj, Manoj Kumar Saxena, Raju S D V S J, Rakesh Sharma and Sanjay Kher) <u>Identification of a dormant thermally-stimulated defect in an optical fibre using a Raman sensor</u> .....	568
Papaelias M Ph (with Roberts C, Davis C L, Blakeley B and Lugg M) <u>High-speed inspection of rolling contact fatigue in rails using ACFM sensors</u> .....	366
Paussu R (see Virkkunen I) .....	271
Pillai S A (with Thomas B P) .....	252
Portella K F (see Mendes R) .....	654
Qingshan Shan (with Shahzad Bhatti, Glover I A, Atkinson R and Rutherford R) <u>Detection of super-high-frequency partial discharge by using neural networks</u> .....	442
Quanli Wang (see Liangjin Lei) .....	508
Raišutis R (see Jasiūnienė E) .....	477
Rajkumar K V (see Satyanarayanan L) .....	384
Raju S D V S J (see Pandian C) .....	568
Rakesh Sharma (see Pandian C) .....	568
Rastkhah N (see Rokrok B) .....	315
Ravanbod H (see Norouzi E) .....	563
Reguly A (see Jacques R C) .....	504
Reguly A (see Martins C O D) .....	8
Reis H (see Apeagyei A K) .....	129
Ren J L (see Ren S K) .....	672
Ren S K (with Fu R Z, Li X L, Yang Y L, Song K and Ren J L) <u>Influences of environmental magnetic field on stress-magnetism effect for 20 steel ferromagnetic specimen</u> .....	672
Roberts C (see Papaelias M Ph) .....	366
Rohani Bastami A (see Behzad M) .....	426
Rokrok B (with Edalati K, Yahaghi E, Mohammadzadeh N, Rastkhah N and Movafeghi A) <u>Three-dimensional mapping of non-complex specimens by image processing and optical density evaluation of digitised radiographs</u> .....	315
Runtao Zhan (with Huicai Xie) <u>GPR measurement of the diameter of steel bars in concrete specimens based on the stationary wavelet transform</u> .....	151
Rutherford R (see Qingshan Shan) .....	442
Salzburger H J (with Schuppmann M, Wang Li and Gao Xiaorong) <u>In-motion ultrasonic testing of the tread of high-speed railway wheels using the inspection system AUROPA III</u> .....	370
Sanjay Kher (see Pandian C) .....	568
Santa-aho S (with Vippola M, Lepistö T and Lindgren M) <u>Characterisation of case-hardened gear steel by multiparameter Barkhausen noise measurements</u> .....	212
Satyanarayanan L (with Rajkumar K V, Sharma G K, Jayakumar T, Krishnamurthy C V, Krishnan Balasubramaniam and Baldev Raj) <u>Investigations on imaging and sizing of defects using ultrasonic phased array and the synthetic aperture focusing technique</u> .....	384

Savin A (see Grimberg R) .....	25
Schuppmann M (see Salzburger H J) .....	370
Scopelliti J (see Obrutsky A) .....	499
Seldis T <u>Ultrasonic properties of reactor pressure vessel strip cladding</u> .....	601
Servent R (see Buckley J) .....	73
Shahzad Bhatti (see Qingshan Shan) .....	442
Shannon B E (with Jaske C E) <u>Optimising reformer tube life by applying advanced inspection and remaining life assessment technology</u> .....	207
Sharma G K (see Satyanarayan L) .....	384
Sheldon J S (see Byington C S) .....	420
Shen Q M (with Gao J M and Li C) <u>Adaptive segmentation of weld defects based on flooding</u> .....	541
Shepherd B (see Gandossi L) .....	16
Shi Duanhu (with Gang Tie and Huang Chuan-hui) <u>Segmentation of small defects in a variable grey-grade image based on wavelet transformation and morphology filtering</u> .....	257
Shiyu Sun (see Fengzhu Ji) .....	32
Simola K (see Gandossi L) .....	16
Simola K (see Gandossi L) .....	650
Šliteris R (see Jasiūnienė E) .....	477
Smith R A (with Nelson L J, Mienczakowski M J and Challis R E) <u>Automated analysis and advanced defect characterisation from ultrasonic scans of composites</u> .....	82
Smulko J (see Hasse L) .....	262
Soleimani M (see Banasiak R) .....	36
Song K (see Ren S K) .....	672
Sosamma S (see Pandian C) .....	568
Stanley R K <u>Development of and results from a new coiled tubing inspection system</u> .....	676
Steigmann R (see Grimberg R) .....	25
Stepinski T (see Hasse L) .....	262
Strohaecker T R (see Jacques R C) .....	504
Swerdon G M (see Byington C S) .....	420
Swinka-Filho V (see Mendes R) .....	654
Thomas B P (with Pillai S A) <u>High-speed generation of digital holographic interferograms and shearograms for non-destructive testing</u> .....	252
Tian G Y (see Mukriz I) .....	21
Tian G Y (see Zainal Abidin I) .....	69
Tse Y Y (see Nageswaran C) .....	660
Umetani K (see Imamura K) .....	12
Van Dalen M (with Wicker C and Wilson G J) <u>Non-destructive testing of materials subject to atmospheric stress corrosion cracking</u> .....	201
Venkataraman K S (see Chandrasekaran J) .....	606
Vippola M (see Santa-aho S) .....	212
Virkkunen I (with Kempainen M, Ostermeyer H, Paussu R and Dunhill T) <u>Grown cracks for NDT development and qualification</u> .....	271
Vladišauskas A (see Jasiūnienė E) .....	477
Vogt T (see Alleyne D N) .....	373
Voleišis A (see Jasiūnienė E) .....	477
Wajman R (see Banasiak R) .....	36
Wall M (with Burch S and Lilley J) <u>Human factors in POD modelling and use of trial data</u> .....	553
Wall M (with Burch S F and Lilley J) <u>Review of models and simulators for NDT reliability (POD)</u> .....	612
Wan Hassan W M S (see Mohd Salleh K A) .....	321
Wang Li (see Salzburger H J) .....	370
Watson M J (see Byington C S) .....	420
Weiguo Wang (see Fengzhu Ji) .....	32
Weimin Bai (with Bueno C, Wong B S and Xin Wang) <u>Generation of radiographic techniques for digital radiography applications</u> .....	327
Whittle M J <u>A review of worldwide practice and experience in the qualification of ultrasonic inspections of nuclear components over the past two decades</u> .....	140
Wicker C (see Van Dalen M) .....	201
Wilson G J (see Van Dalen M) .....	201
Wong B S (see Weimin Bai) .....	327
Wright D C (see Milne K) .....	378
Xiangchao Hu (see Yunze He) .....	310
Xin Wang (see Weimin Bai) .....	327
Yahaghi E (see Rokrok B) .....	315
Yang Y L (see Ren S K) .....	672
Yanhua Sun (with Yihua Kang) <u>High-speed MFL method and apparatus based on orthogonal magnetisation for steel pipe</u> .....	548
Yihua Kang (see Yanhua Sun) .....	548
Yin X (with Diamond G G and Hutchins D A) <u>Further investigations into capacitive imaging for NDE</u> .....	484
Yong Li (see Mukriz I) .....	21
Yong Li (see Zainal Abidin I) .....	69
Yunze He (with Feilu Luo, Xiangchao Hu, Bo Liu and Junzhe Gao) <u>Defect identification and evaluation based on three-dimensional magnetic field measurement of pulsed eddy current</u> .....	310
Zainal Abidin I (with Mandache C, Tian G Y and Yong Li) <u>Defect depth estimation using pulsed eddy current with varied pulse width excitation</u> .....	69

## SUBJECT INDEX

### ACOUSTIC EMISSION METHODS

AE signals as laser cutting quality indicators,  
by T Kek and J Grum ..... 124

Assessment of low-temperature embrittlement of asphalt binders using an acoustic emission approach,  
by A K Apeagyei, W G Buttlar and H Reis ..... 129

Acoustic emission testing in wires from the tensile armour of flexible risers under load,  
by R C Jacques, J V Flores, T R Strohaecker and A Reguly ..... 504

### CONCRETE TESTING

GPR measurement of the diameter of steel bars in concrete specimens based on the stationary wavelet transform,  
by Runtao Zhan and Huihai Xie ..... 151

Determination of crushed stone volume in concrete cores from hydroelectric power plant dams by three-dimensional tomography,  
by R Mendes, K F Portella, W C Godoi, J C A Galvão, A Joukoski, P Martins, V Swinka-Filho and K de Geus ..... 654

### CONDITION MONITORING

Characterisation of case-hardened gear steel by multiparameter Barkhausen noise measurements,  
by S Santa-aho, M Vippola, T Lepistö and M Lindgren ..... 212

Shaft coupling model-based prognostics enhanced by vibration diagnostics,  
by C S Byington, M J Watson, J S Sheldon and G M Swerdon ..... 420

Defect size estimation in rolling element bearings using vibration time waveform,  
by M Behzad, A AlandiHallaj, A Rohani Bastami, D Mba, B Eftekharnejad and B Charnley ..... 426

Fault diagnosis of an electro-pump in a marine ship using vibration condition monitoring,  
by H Ahmadi and K Mollazade ..... 431

Theoretical investigation of the use of a moving vehicle to identify bridge dynamic parameters,  
by P J McGurk, A González and E J O'Brien ..... 433

Detection of super-high-frequency partial discharge by using neural networks,  
by Qingshan Shan, Shahzad Bhatti, I A Glover, R Atkinson and R Rutherford ..... 442

An intelligent model based on data mining and fuzzy logic for fault diagnosis of external gear hydraulic pumps,  
by K Mollazade, H Ahmadi, M Omid and R Alimardani ..... 594

### DATA FUSION

Ultrasound and eddy current data fusion for evaluation of carbon-epoxy composite delaminations,  
by R Grimberg, A Savin, R Steigmann, A Bruma and P Barsanescu ..... 25

### ELECTROMAGNETIC METHODS

Micromagnetic stress evaluation of flexible riser tensile armours,  
by C O D Martins and A Reguly ..... 8

3D transient magnetic field mapping for angular slots in aluminium,  
by I Mukriz, G Y Tian and Yong Li ..... 21

Application of 3-D FEM in the simulation analysis for MFL signals,  
by Fengzhu Ji, Changlong Wang, Shiyu Sun and Weiguo Wang ..... 32

Defect depth estimation using pulsed eddy current with varied pulse width excitation,  
by I Zainal Abidin, C Mandache, G Y Tian and Yong Li ..... 69

Defect identification and evaluation based on three-dimensional magnetic field measurement of pulsed eddy current,  
by Yunze He, Feilu Luo, Xiangchao Hu, Bo Liu and Junzhe Gao ..... 310

RBF-based compensation of velocity effects on MFL signals,  
by Liangjin Lei, Changlong Wang, Fengzhu Ji and Quanli Wang ..... 508

High-speed MFL method and apparatus based on orthogonal magnetisation for steel pipe,  
by Yanhua Sun and Yihua Kang ..... 548

Optimisation of the flux distribution in magnetic flux leakage testing,  
by E Norouzi and H Ravanbod ..... 563

Influences of environmental magnetic field on stress-magnetism effect for 20 steel ferromagnetic specimen,  
by S K Ren, R Z Fu, X L Li, Y L Yang, K Song and J L Ren ..... 672

Development of and results from a new coiled tubing inspection system,  
by R K Stanley ..... 676

### FLUORESCENT PENETRANT INSPECTION

Engineering studies for fluorescent penetrant inspection with a focus on developer application methods,  
by L Brasche, R Lopez, D Eisenmann and K Griffiths ..... 88

Vibro-enhanced fluorescent penetrant inspection (FPI),  
by K Milne, P Cawley, A Dunhill and D C Wright ..... 378

### GUIDED WAVES

The choice of torsional or longitudinal excitation in guided wave pipe inspection,  
by D N Alleyne, T Vogt and P Cawley ..... 373

Higher order modes cluster (HOMC) guided waves for online defect detection in annular plate region of above-ground storage tanks,  
by J Chandrasekaran, I Anto, K Balasubramanian and K S Venkataraman ..... 606

High-frequency guided waves for defect detection in stiffened plate structures,  
by B Masserey and P Fromme ..... 667

### IMAGE PROCESSING

An efficient nodal Jacobian method for 3D electrical capacitance tomography image reconstruction,  
by R Banasiak, R Wajman and M Soleimani ..... 36

Three-dimensional mapping of non-complex specimens by image processing and optical density evaluation of digitised radiographs,  
by B Rokrok, K Edalati, E Yahaghi, N Mohammadzadeh, N Rastkhah and A Movafeghi ..... 315

### IMAGING

Sensitive inspection of void defects using synchrotron refraction imaging with quantitative modelling of contrast enhancement,  
by K Imamura, Y Inada, N Ehara, K Umetani and Y Nakajima ..... 12

Reverse geometry X-ray imaging,  
by F Malglaise and R D Albert ..... 66

Further investigations into capacitive imaging for NDE,  
by X Yin, G G Diamond and D A Hutchins ..... 484

### INSPECTION QUALIFICATION AND RELIABILITY

The link between risk-informed in-service inspection and inspection qualification,  
by L Gandossi, K Simola and B Shepherd ..... 16

A review of worldwide practice and experience in the qualification of ultrasonic inspections of nuclear components over the past two decades,  
by M J Whittle ..... 140

Grown cracks for NDT development and qualification,  
by I Virkkunen, M Kempainen, H Ostermeyer, R Paussu and T Dunhill ..... 271

Human factors in POD modelling and use of trial data,  
by M Wall, S Burch and J Lilley ..... 553

Review of models and simulators for NDT reliability (POD),  
by M Wall, S F Burch and J Lilley ..... 612

## IN-SERVICE INSPECTION

- Non-destructive testing of materials subject to atmospheric stress corrosion cracking,  
by M Van Dalen, C Wicker and G J Wilson ..... 201

- Optimising reformer tube life by applying advanced inspection and remaining life assessment technology,  
by B E Shannon and C E Jaske ..... 207

- Activities on risk-informed in-service inspection within the ENIQ network,  
by L Gandossi and K Simola ..... 650

## LASER TECHNIQUES

- Small turbine blade inspection using laser strain techniques,  
by G Harvey and J Jones ..... 137

## MODELLING

- Recent advances and current trends of ultrasonic modelling in CIVA,  
by S Mahaut, M Darmon, S Chatillon, F Jenson and P Calmon ..... 78

## OPTICAL METHODS

- Theories and industrial applications of optical interferometric NDT techniques: A review,  
by Haixia Shang and Jianxin Gao ..... 240

- High-speed generation of digital holographic interferograms and shearograms for non-destructive testing,  
by B P Thomas and S A Pillai ..... 252

- Quality assessment of varistor ZnO structures by resonant ultrasound spectroscopy,  
by L Hasse, M Kiwilszo, J Smulko and T Stepinski ..... 262

- Identification of a dormant thermally-stimulated defect in an optical fibre using a Raman sensor,  
by C Pandian, S Sosamma, M Kasinathan, C Babu Rao, N Murali, T Jayakumar, Baldev Raj, Manoj Kumar Saxena, S D V S J Raju, Rakesh Sharma and Sanjay Kher ..... 568

## RADIOGRAPHY including DIGITAL RADIOGRAPHY

- Modulation transfer function (MTF) and noise power spectrum (NPS) studies on three industrial digital radiography (IDR) systems,  
by K A Mohd Salleh, A R Hamzah and W M S Wan Hassan ..... 321

- Generation of radiographic techniques for digital radiography applications,  
by Weimin Bai, C Bueno, B S Wong and Xin Wang ..... 327

## RAIL INSPECTION

- High-speed inspection of rolling contact fatigue in rails using ACFM sensors,  
by M Ph Papaelias, C Roberts, C L Davis, B Blakeley and M Lugg ..... 366

## ROPE TESTING

- Performance comparison of drive ropes in a cable belt conveyor system using an NDT technique,  
by D Basak ..... 439

## SIGNAL PROCESSING

- Segmentation of small defects in a variable grey-grade image based on wavelet transformation and morphology filtering,  
by Shi Duanhu, Gang Tie and Huang Chuan-hui ..... 257

## STRUCTURAL HEALTH MONITORING

- Non-destructive testing methods used for the study of cultural heritage in Argentina,  
by A Obrutsky, D Acosta, A Garcia and J Scopelliti ..... 499

## ULTRASONIC TESTING

- Improvements in ultrasonic inspection of resistance spot welds,  
by J Buckley and R Servent ..... 73

- Automated analysis and advanced defect characterisation from ultrasonic scans of composites,  
by R A Smith, L J Nelson, M J Mienczakowski and R E Challis ..... 82

- Towards automatic analysis of ultrasonic time-of-flight diffraction data using genetic-based Inverse Hough Transform,  
by K Maalmi, R Benslimane, L F C Lew Yan Voon and E Fauvet ..... 184

- Automated Ultrasonic Testing (AUT) – Qualifications and variations,  
by L L Morgan ..... 266

- In-motion ultrasonic testing of the tread of high-speed railway wheels using the inspection system EUROPA III,  
by H J Salzburger, M Schuppmann, Wang Li and Gao Xiaorong ..... 370

- Investigations on imaging and sizing of defects using ultrasonic phased array and the synthetic aperture focusing technique,  
by L Satyanarayan, K V Rajkumar, G K Sharma, T Jayakumar, C V Krishnamurthy, Krishnan Balasubramaniam and Baldev Raj ..... 384

- NDT of wind turbine blades using adapted ultrasonic and radiographic techniques,  
by E Jasiūnienė, R Raišutis, R Šliteris, A Voleišis, A Vladičauskas, D Mitchard and M Amos ..... 477

- Ultrasonic array inspection of the Clifton Suspension Bridge chain-links,  
by B W Drinkwater and A I Bowler ..... 491

- Ultrasonic properties of reactor pressure vessel strip cladding,  
by T Seldis ..... 601

## WELD INSPECTION

- Optimal selection of non-destructive inspection technique for welded components,  
by M Khalifa, F Khan and M Haddara ..... 192

- Adaptive segmentation of weld defects based on flooding,  
by Q M Shen, J M Gao and C Li ..... 541

- Microstructural quantification, modelling and array ultrasonics to improve the inspection of austenitic welds,  
by C Nageswaran, C Carpentier and Y Y Tse ..... 660