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Non-Destructive Testing 2013**

(NDT 2013)

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NDT 2013 Conference Topics - Tuesday 10th

09.00 Roy Sharpe prize lecture - New approaches in ultrasonic guided waves for industrial solutions

Authors - Prof Krishnan Balasubramaniam, Dean of Industrial Consultancy and Sponsored Research (ICSR), Head of Centre for Non-destructive Evaluation (CNDE) Indian Institute of Technology Madras, Chennai, India

Session IA – Advanced ultrasonics

Chair: Dr A Gachagan Wenlock suite

10.50 Using pulsed array frequency measurements to locate defects

Authors - S J Hill and S Dixon University of Warwick

11.15 Linear and non-linear ultrasonic NDE of titanium diffusion bonds

*Authors - E Escobar-Ruiz¹, P Cawley¹, P B Nagy² and ¹ Collison³
¹Imperial College ²University of Cincinnati ³Rolls-Royce plc*

11.40 Procedure for the recovery time estimation of the ultrasonic preamplifier

*Authors - L Svilainis, V Dumbrava and A Chaziachmetovas
Kaunas University of Technology*

12.05 Flexural mode metal cap transducer design for specific frequency air coupled ultrasound generation

*Authors - Tobias J.R. Eriksson (University of Warwick)
Second Authors - Steve Dixon and Nishal Ramadas*

12.30 In Process control of friction welding processes using non-linear ultrasonic test techniques

Authors - FW Chen, G Asfis and F Hagglund TWI Ltd Cambridge

NDT 2013 Conference Topics - Tuesday 10th

Session IB – Eddy currents

Chair: **Prof R Smith** *Coalport I suite*

10.50 On the one-point calibration of eddy current phase transducers on example of zinc coating thickness gauges

*Authors - Vladimir A. Syasko, Irina V. Pilatova
Constanta Ltd*

11.15 Probability of detection analysis for eddy current Inspection systems

Author - J Brown Aerojet Rocketdyne

11.40 Characterising eddy-current array sensitivity

*Authors - R R Hughes and S M Dixon
University of Warwick*

12.05 A method of determining eddy current instrument response from models

*Authors - S Majidnia^{1,2}, C Schneider² and J Rudlin²
¹Brunel University ²TWI Ltd*

12.30 Simulation study on sequential image features of eddy current stimulated thermography for NDT

*Authors - S Yang, Y Xiangxiang, Z Jjinjing and L Chunhu
Sichuan University*

NDT 2013 Conference Topics - Tuesday 10th

Session 1C – Monitoring

Chair: Dr S Pickering Coalport 2 suite

10.50 Low-profile transducers for high-temperature monitoring

*Authors - K J Kirk, R Hou, and D Hutson
University of the West of Scotland*

11.15 Feasibility study of fatigue crack monitoring at elevated temperature using an ultrasonic array system

Author - X Xi and F Cegla Imperial College

11.40 Passive wireless sensing devices for structural health monitoring

*Authors - D Graham, J A Neasham and GYTian
Newcastle University*

12.05 Characterisation of acoustic emissions from journal bearings for fault detection

*Authors - H Towsyfyfan, P Raharjo, F Gu and A Ball
University of Huddersfield*

12.30 Pipe wall thickness measurement techniques for digital radiography

*Authors - R Pincu, L Pick and R Lieberman
Vidisco Ltd*

NDT 2013 Conference Topics - Tuesday 10th

Session IE – **Research and development**

Chair: **Mr R Lyon** *Ironbridge suite*

10.50 Efficient computation of delay law for imaging a structure with a complex surface

Authors - J Zhang, BW Drinkwater and P D Wilcox University of Bristol

11.15 Endoscopic system for in-situ ultrasonic inspection of aeroengines using optically excited ultrasonic transducers

*Author - T Stratoudaki I V Ageeva¹, M Clark¹ M G Somekh¹, J Kell², and D C Wright²
¹University of Nottingham ²Rolls-Royce plc*

11.40 Development of passive wireless ultrasonic transducer systems for non-destructive testing

*Authors - C H Zhong, A Croxford and P Wilcox
University of Bristol*

12.05 Research on the experiment system for the inductive displacement sensor in the optical synthesis telescope

*Authors - Q Luo¹ and Y Zhang²
¹Institute of unmanned aerial vehicle, Nanjing University of Aeronautics and Astronautics
²School of Automation Engineering, Nanjing University of Aeronautics and Astronautics*

12.30 The research of corrosion monitoring on pipe based on flexible ultrasound sensor

*Authors - Q Luo¹, H Wang² and D Xu
¹Research Institute of unmanned aircraft, Nanjing University of Aeronautics & Astronautics
²School of Automation Engineering, Nanjing University of Aeronautics and Astronautics*

NDT 2013 Conference Topics - Tuesday 10th

Session 1D – Commercial session

Chair: J Hansen Exhibition Hall 3

10.50 Introduction to Vidisco's newest DDA imager (BOLT-X PRO)

Authors - R Pincu Vidisco Ltd Eli Dayan will present

11.15 NDT in the digital era

Author - N Harrap Ashtead Technology

11.40 Novel Embedded Ultrasonic Systems

Author - P Harper Tribosonics Ltd.

12.05 Pipeline external corrosion analysis using a 3D laser scanners

Authors - P-H Allard CREAFORM

12.30 New developments in eddy current NDT

Author - J Hansen ETher NDE

NDT 2013 Conference Topics - Tuesday 10th

Session 2A – Ultrasonic wave types for specific applications

Chair: **Dr I Baillie** *Wenlock Suite*

14.30 Thickness measurements of sub-millimeter thickness foils using Lamb wave dispersion

*Authors - K L McAughey, R S Edwards, M D G Potter and S Dixon
University of Warwick*

14.55 Characterisation of branched defects using Rayleigh waves

*Authors - F Hernández-Valle, A R Clough and R S Edwards
Dept. of Physics, University of Warwick*

15.20 Guided wave propagation in an elastic hollow cylinder coated with viscoelastic materials of varying thickness

*Authors - E Karaiskos¹, P Cawley¹ and T Vogt²
¹Imperial College ²Guided Ultrasonics Ltd*

16.30 Defect detection and thickness measurement using horizontally polarised shear waves and periodic permanent magnet EMATs

Authors - P A Petcher, S E Burrows, and S Dixon University of Warwick

16.55 Inspection of composite-panel stiffeners using Rayleigh edge waves

Authors - C Courtney University of Bath

NDT 2013 Conference Topics - Tuesday 10th

Session 2B – Electromagnetics

Chair – Dr J Rudlin Coalport I Suite

14.30 High-speed ACFM for the inspection of rail

Author - B Blakeley TSC Ltd

14.55 Assessment of electromagnetic properties of power station steels for lifetime extension

Authors - N Karimian¹, J W Wilson¹, W Yin¹, J Liu², M Strangwood²,
C L Davis² and A J Peyton¹
¹University of Manchester, ²University of Birmingham

15.20 A potential drop strain sensor for *in-situ* power station creep monitoring

Authors - J Corcoran¹, P Cawley¹ and P B Nagy^{1,2}
¹Imperial College London ²University of Cincinnati

16.30 Towards the development of a field deployable EM inspection tool for the evaluation of power station steels

Authors - J W Wilson¹, N Karimian¹, W Yin¹, J Liu², M Strangwood²,
C L Davis² and A J Peyton¹
¹University of Manchester ²University of Birmingham

16.55 Measurement and monitoring of corrosion under insulation using passive LF RFID

Authors - M Alamin¹, G Y Tian¹, A Andrews² and P Jackson²
¹Newcastle University ²International Paint Ltd

NDT 2013 Conference Topics - Tuesday 10th

Session 2C – NDT of composites

Chair – Prof A Dunhill Coalport 2 Suite

14.30 3D characterisation of fibre orientation and resulting material properties

*Authors - R A Smith, G Roldo, S Mukhopadhyay, A Lawrie and S R Hallett
University of Bristol*

14.55 Thermographic NDE methods for composite materials

*Authors - D P Almond, S G Pickering and U Polimeno
RCNDE, Department of Mechanical Engineering, University of Bath*

15.20 2D ultrasonic array transducer design to maximise inspection coverage in composite material structures

*Authors - A Gachagan and J Dziewierz
University of Strathclyde*

16.30 Advanced ultrasonic array inspection of composite components

Authors - P D Wilcox University of Bristol

16.55 Stiffness matrix inference of composite plates from group velocity measurements of ultrasonic guided waves

*Authors - O Putkis^{1,2}, R P Dalton², and A J Croxford¹
¹University of Bristol ²QinetiQ Ltd*

NDT 2013 Conference Topics - Tuesday 10th

Session 2E – Applications

Chair – Mr R Lyon Ironbridge Suite

14.30 Inspection of thin steel gauge welds for the shipping industry using laser guided inspection robot

Authors - C Carpentier¹, D Panggabean¹, V Papadimitriou¹, I Roditis¹, P Chatzacos¹ and SA Innora²

¹TWI Ltd ²Innovation Robotics Automation

14.55 Eddy current testing of austenitic stainless steels

Authors - H Wang and S Jiang
School of Automation Engineering,
Nanjing University of Aeronautics & Astronautics, China

15.20 Non-linear acoustics techniques for NDT

Authors - J R Wright, P R Armitage and T D Mottram
Theta Technologies Limited

16.30 European Federation for Non-Destructive Testing (EFNDT) – goals, activities and visions

Author - M Purschke EFNDT President

16.55 1000 Gates – a novel approach and method for ultrasonic inspection of aero-engine disc forgings

Authors - D C Wright¹, A Miltreyger², M Bron2 and S Rabinovich²

¹Rolls Royce plc ²ScanMaster Systems Ltd

NDT 2013 Conference Topics - Tuesday 10th

Session 2D – Commercial session

Chair: **G Long** *Exhibition Hall 3*

14.30 **Issues involved in launching a new light meter and acceptance of LED UV lights in industry**

Author - P Burrows Baugh & Weedon

14.55 **Non-contact vibration measurement using laser Doppler vibrometry**

Authors - J Armstrong Polytec Ltd

15.20 **Anyone can sell a box – a manufacturer's perspective on NDT**

Author - M Nel Technology Design Ltd

16.30 **Latest developments in computed radiography**

Author - O Ruzek Durr NDT

16.55 **TRADE AGM assemble in the MT presentation area**

NDT 2013 Conference Topics - Wednesday 11th

09.00 Plenary Paper: Review of high-resolution time-of-flight estimation techniques for ultrasonic signals

Author - Prof L Svilainis, Kaunas University of Technology - Wenlock Suite

Session 3A – NDT of composites and bonded materials

Chair: Prof S Dixon Wenlock suite

09.50 Tap testing of composites benchmarked with digital shearography

Authors - J Gryzagoridis and D Findeis University of Capetown

10.15 NDT of adhesively bonded sheet-metal joints with ultrasonic matrix array technique

Authors - R Maev¹, S Titov¹, A Bogachenkov², and L Barsanti²

¹University of Windsor ²Institute of BioChemical Physics of RAS ³Tessonics Corp

11.10 Development of a rapid inspection system for aerospace composite structure - the IntACoM project

Authors - I Cooper, I Nicholson, D Yan, D Liaptsis and B Wright

TWI NDT Validation Centre (Wales) Ltd

11.35 *Free slot available for a late submission*

NDT 2013 Conference Topics - Wednesday 11th

Session 3B – NDT technique validation

Chairs: Dr J Rudlin and C Schneider Coalport 1 Suite

09.50 Technique validation: the need to revisit

Authors - R Smith University of Bristol

A simulation supported approach to determining probability of detection curves

Author - T Barden Rolls-Royce plc

10.15 It takes more than a statistician to do POD

Author - J Brown Aerojet Rocketdyne

11.10 Beyond the single predictor variable POD model

Author - J Brown Aerojet Rocketdyne

11.35 Improving the reliability of automated non-destructive inspection

*Authors - N Brierley, T Tippetts and P Cawley
Imperial College London*

NDT 2013 Conference Topics - Wednesday 11th

Session 3C – NDT of anisotropic materials

Chair: **Dr A J Croxford Coalport 2 Suite**

09.50 Accurate modelling of anisotropic effects in austenitic steel welds

Authors - O Nowers^{1,2}, D Duxbury¹, A Velichko² and B Drinkwater²
¹Rolls-Royce Marine ²University of Bristol

10.15 A mathematical model based approach for sizing cracks in stainless steel welds

Authors - L Cunningham¹, A J Mulholland¹, G Harvey² and C Bird³
¹University of Strathclyde ²Weidlinger Associates, PZFlex Europe
³Doosan Power Systems

11.10 Array imaging of austenitic welds by measuring weld material map

Authors - D Fan and M Lowe Imperial College

11.35 Non-destructive characterisation of welding-induced anisotropy in steel by magnetic Barkhausen noise

Author - M Blaow University of Misurata

NDT 2013 Conference Topics - Wednesday 11th

Session 3D – Commercial session

Chair: **J Moody** *Exhibition Hall 3*

09.50 **Developments in guided wave technology for long pipeline inspections**

Author - T Couturier Olympus

10.15 **NDT for 3D printing of metals**

Authors - K Milne The Manufacturing Technology Centre

11.10 **Using phased array for ‘trivial’ applications**

Author - J Buckley Sonatest

11.35 **New capabilities for portable phased array instruments and their applications**

Author - F Mainguy Imaginos

NDT 2013 Conference Topics - Wednesday 11th

Session 4A – NDT of wind turbines

Chair: **Dr C Brett Wenlock Suite**

14.20 Study of hybrid non-destructive testing suitable for inspection in wind turbine blades

Authors - Yu-P Tian, Ke-Yin Zhou, S-S Wang, E Yao and J Xu
Nanjing University of Aeronautics and Astronautics

14.45 Development of an optimised array wheel probe for inspection of fibreglass composites

Author - J Buckley Sonatest Ltd

15.10 *Free slot available for a late submission*

15.35 *Free slot available for a late submission*

16.45 President's Honour Lecture – The coming marriage of NDT and structural integrity – a glimpse of their future life together

Author - Prof P Irving from Cranfield University - Wenlock Suite

NDT 2013 Conference Topics - Wednesday 11th

Session 4B – **Theoretical modelling**

Chair: **Prof M Lowe Coalport I Suite**

14.20 Automation of simulation supported POD computations with CIVA for power generation industry

Authors - S Lonne¹, J Gaine¹, F Foucher¹, S Laborde², A Heger² and K Steigleder²
¹Extende ²Alstom Ltd

14.45 Simulation of positron source based on the conversion of the electron beam generated by small-sized betatrons

Authors - R S Laptev, A S Gogolev, M M Rychkov, A P Shestak, E L Malikov, A M Lider and Y S Bordulev
National Research Tomsk Polytechnic University

15.10 Design, simulation and fabrication of gravity die casting mould to achieve complete mould filling

Authors - Y P Lim, W H Yeo and C C Wang Universiti Tunku Abdul Rahman

15.35 Adaptive grids for limited view tomography

Authors - M Goswami¹, A Saxena² and P Munshi^{1, 2}
¹Nuclear Engineering and Technology Programme
²Department of Mechanical Engineering, Indian Institute of Technology

NDT 2013 Conference Topics - Wednesday 11th

Session 4C – Industrial applications

Chair: **Dr E A Birt Coalport 2 Suite**

14.20 Ultrasonic evaluation of anticorrosive copper cold spray coating of steel nuclear waste containers

Authors - R Gr Maev¹, S Titov¹, D Doyle² and C Hatton²

¹Institute for Diagnostic Imaging Research, University of Windsor

²Nuclear Waste Management Organization

14.45 Non-invasive inspection of heat exchanger tubes

Authors - N Amir AcousticEye Ltd

Y Harel to present

15.10 Application of 3D laser method for corrosion assessment on a spherical pressure vessel

Authors - P H Allard and J S Fraser Creaform – NDT

15.35 Impact of 3D laser data resolution and accuracy on pipeline dents strain analysis

Authors - P H Allard and J S Fraser Creaform – NDT

NDT 2013 Conference Topics - Wednesday 11th

Session 4D – Commercial session

Chair: **C Sinclair** *Exhibition Hall 3*

13.55 My life as a woman in NDT

Author - G Long Testrade

**14.45 Developments with eddy current array and bond testing
C-scan**

Author - P Edwards Olympus

15.10 The value of a BINDT/PCN working group

Author - PJ Moody BINDT

**15.35 Multiplexed eddy current array probes for heat
exchanger inspection**

Author - N Decourcelle Eddyfi

NDT 2013 Conference Topics - Thursday 12th

08.45 Plenary presentation - NDT Report

Author - Dr R Young, Materials KTN - Wenlock Suite

Session 5A – Modelling

Chair: Dr R Chapman Wenlock suite

09.10 Obtaining geometries of real cracks and using an efficient finite element model to simulate their ultrasonic array response

*Authors - M V Felice¹, A Velichko¹, P D Wilcox¹, T J Barden², and Tony K. Dunhill²
¹University of Bristol, ²Rolls-Royce plc*

09.35 Improved detection of rough defects for ultrasonics inspection based on finite element modelling of elastic wave scattering

*Authors - J R Pettit¹, M J S Lowe² and A Walker¹
¹Rolls-Royce Submarines ²Imperial College London*

10.00 Modelling the scattering of ultrasonic signals from 3D rough surfaces using the distributed point source method (DPSM)

Authors - D Benstock and F Cegla Imperial College London

10.25 Modelling of weld inspection by using a paraxial ray-tracing

*Authors - N Leymarie¹, A Gardahaut I, K Jezzine¹, E Lakovleva¹,
F Rupin² and B Chassignole²
¹CEA ²EDF R&D*

10.50 Thermal studies of a plate waveguide bundle for ultrasonic flow metering applications

*Authors - M Laws¹, S N Ramadas² and S Dixon¹
¹University of Warwick ²Elster NV/SA2*

NDT 2013 Conference Topics - Thursday 12th

Session 5B – Automated and robotic NDT

Chair: **Mr T O'Hare Coalport I Suite**

09.10 Computer-aided tool path generation for robotic non-destructive inspection

Authors - M Morozov¹, S G Pierce¹, C Mineo¹, P I Nicholson² and I Cooper²
¹University of Strathclyde ²TWI Technology Centre

09.35 Automatic ultrasonic robotic array (AURA)

Authors - G Dobie¹, C MacLeod¹, R Summan¹, G Pierce¹, A Gachagan¹,
G Hayward², A Gillies², R Taneja³ and S Kelly³
¹University of Strathclyde ²Alba Ultrasound ³Doosan Babcock

10.00 Lessons learned from the development of robot deployed guided wave ultrasonic testing system for inspecting mooring chains in-situ

Author - G Edwards TWI Ltd

10.25 Automated aerial inspection platforms

Authors - C N Macleod¹, J Cao¹, S G Pierce¹, G Dobie¹, R Summan¹,
J C Sullivan² and A Pipe²
¹University of Strathclyde ²University of the West of England

10.50 An automated miniature robotic vehicle inspection system

Authors - G Dobie, C MacLeod, R Summan, W Galbraith and G Pierce
University of Strathclyde

NDT 2013 Conference Topics - Thursday 12th

Session 5C – Industrial applications

Chair: **Prof K Newton Coalport 2 Suite**

09.10 Development of an advanced ultrasonic inspection tool for rapid volumetric examination of aluminothermic rail welds

Authors - L Zhao and J Rudlin TWI Ltd

09.35 Ultrasonic identification of dry intermediate storage casks

Authors - M Kroening¹, A Lider¹, D Demyanyuk¹, D Sednev¹ and D Chumak²

¹National Research Tomsk Polytechnic University

²Mechnikov University

10.00 Non-destructive testing of pallet defects by multichannel ultrasound system

Author - A I Soldatov, P V Sorokin, V S Makarov, A A Soldatov, K G Kvasnikov, I O Bolotina

Tomsk Polytechnic University

10.25 Digital radiography of welds with microfocus rod anode tubes

Author - J P Steffen, Ph.d. X-RAY WorX GmbH

10.50 Numerical thermal characterisation of the effect of hidden rust in pipelines

Authors - A Elafi and S Belattar Faculty of Sciences Semailia

NDT 2013 Conference Topics - Thursday 12th

Session 5D – Commercial session

Chair: **R Evans** *Exhibition Hall 3*

09.10 Accessing public and private finance to fund new product development

Author - V Mistry Pera Technology

09.35 Applications of the NDT simulation software: CIVA II

Author - F Foucher EXTENDE

10.00 Certification – What happened to EN473?

Author - S Lavender Lavender International

10.25 So you want to be a Level 3 – a workshop

Author - S Lavender Lavender International

10.50 Portable hardness testing on HAZ

Authors - S Underwood and M Denton-Masih Proceq

NDT 2013 Conference Topics - Thursday 12th

Session 6A – Modelling

Chair: **Dr A Mulholland Wenlock Suite**

12.00 3D modelling of ultrasonic testing in austenitic welds

Authors - B Chassignole¹, P Recolin², N Leymarie³, D Elbaz⁴, G Corneloup⁵
C Gueudre⁵ and P Guy⁶

¹EDF R&D, ²DCNS, ³CEA, ⁴Extende, ⁵Aix-Marseille University and ⁶INSA de Lyon

12.25 Simulation on quantitative analysis of crack inspection by using eddy current stimulated thermography

Author - L Feng Sichuan University

12.50 New models for ultrasonic guided wave inspections in CIVA

Authors - V Baronian, K Jezzine, N Dominguez and S Chatillon CEA

13.15 Ultrasonic modelling to design a phased array probe for the testing of railway solid axles from the end face

Authors - D Liaptsis¹, S Avramidis¹, D Yan¹, S Michau² and A Ngyendinh²

¹TWI Technology Centre (Wales) ²Vermon SA

NDT 2013 Conference Topics - Thursday 12th

Session 6B – Industrial applications

Chair: **Dr B Fernandes Coalport I Suite**

12.00 Automated identification of diabetic retinopathy in fundus image

Authors - O Zahran¹, E M Shahin¹, E S M EL-Rabaie¹, T E Taha¹,
F E Abd El-Samie¹ and W Al-Nauimy²
¹Menofia University ²University of Liverpool

12.25 Interpreting MIL-HDBK-1823 for application to probability of detection demonstration tests on a fluorescent penetrant inspection system

Author - J Brown Aerojet Rocketdyne

12.50 Real-time inspection of industrial complex components with a smart flexible transducer array

Authors - S Robert¹, S Bey¹, T Desrez¹, A Vanhoye¹ and P Dumas²
¹CEA, LIST ²Imasonic

13.15 Automated object recognition in baggage screening using multiple X-ray views

Authors - D Mery and V Riffó, Pontificia Universidad Católica de Chile

NDT 2013 Conference Topics - Thursday 12th

Session 6C – Novel techniques

Chair: **Prof R Smith Coalport 2 Suite**

12.00 Optimal sensor locations and ultrasound tomography set-up design for limited data problems

Authors - M Goswami¹, V S Bhadouria¹, N Agrawal², A Khanna³, P Munshi^{1, 2}, N N Kishore², and A Saxena²

¹Nuclear Engineering and Technology Programme

²Department of Mechanical Engineering

³Department of Chemical Engineering Indian Institute of Technology

12.25 Non-destructive characterisation techniques in analysing basic functional properties of nickel-based electroless thin-film coating on mild steel substrate

Author - O R Oloyede, Z. Liu, H. Liu

University of Manchester¹ Shandong Polytechnic University²

12.50 Inspection of laser powder deposited layers

Authors - J Rudlin¹, D Cerniglia² and M Scafidi²

¹TWI Ltd ²University of Palermo

13.15 Free slot available for a late submission

NDT 2013 Conference Topics - Thursday 12th

Session 6D – Commercial session

Chair – J Buckley Exhibition Hall 3

12.00 50 years behind the probe – a personal review of NDT application

Author - J Brown CEng MInstNDT LEP

12.25 Semi-autonomous ultrasonic tank floor inspection

Authors - E Zwicker and M Kayous ALSTOM Inspection Robotics

12.50 Development of a phased array inspection system for the testing of railway solid axles from the end face

*Authors - D Liaptsis¹, S Avramidis¹, D Yan¹, N Hankinson², S Michau³,
A Ngyendinh³, I Castro⁴, K Lobato⁴, J Dominguez⁴ and S Broujeni⁵
¹TWI Technology Centre (Wales) ²Phoenix Inspections Systems Limited
³Vernon SA ⁴Ideko- IK4 ⁵Balfour Beatty Rail*

13.15 Underwater inspections with ACFM

Author - C Blinkenberg TSC Ltd