ASME® 2021 QNDE

Annual Review of Progress in Quantitative Nondestructive Evaluation

CONFERENCE
July 28–30, 2021

Virtual, Online

Program

https://event.asme.org/QNDE

The American Society of Mechanical Engineers®
ASME®

ASME®
SETTING THE STANDARD

TABLE OF CONTENTS

Thank you to our Bronze Sponsor

Verasonics®
The leader in Research Ultrasound™

https://event.asme.org/QNDE

STAY CONNECTED TO ASME:

YouTube, Twitter, Facebook & LinkedIn

Not a member of ASME yet? Learn more and join today at:

https://www.asme.org/membership

WELCOME TO QNDE 2021

As the QNDE 2021 conference Chair and Co-Chairs, and NDPD Division Chair it is our privilege and honor to welcome you to the 48th Annual Review of Progress in Quantitative Non-Destructive Evaluation conference. Last year even in the middle of pandemic the QNDE 2020 was successfully held virtually because of the determination and hard work of the organizing committee, ASME supporting staff, authors, moderators, panelists, and plenary speakers.

Being inspired by the success of 2020 conference it was decided that the QNDE 2021 would be again a virtual conference due to uncertainty of the pandemic created travel restrictions in summer 2021. Plenary speakers, session chairs and authors committed to present their speeches live from different parts of the world while adjusting their vacations and bedtimes! With all the expressed support, our decision was made to go ahead with the virtual event in 2021 and postpone the in-person conference to 2022 when pandemic will be well under control.

We believe you will enjoy the conference. We also understand that no matter how well we prepare for it, in some areas things might not run as planned or can be improved further. We will invite your feedback afterwards, to help us to prepare for the 2022 in-person event.

We are extremely grateful to the ASME support staff for their tireless efforts to work with us to make it all happen. We have a terrific slate of speakers, panelists, and moderators ready to engage us in a successful three-day conference experience. We encourage you to be all-in as much as possible the next few days, so you can get the most out of your time with us.

Thank you for your support. We are all looking forward to “seeing you” at the conference!

Sincerely,

Tribikram (Bikram) Kundu, *University of Arizona,* Conference Chair
Henrique Reis, *University of Illinois at Urbana-Champaign*, Conference Co-Chair
Jeong-Beom (JB) Ihn, *The Boeing Company*, Conference Co-Chair
Yuris Dzenis, *University of Nebraska - Lincoln*, NDPD Division Chair

https://event.asme.org/QNDE

THANK YOU TO THE 2021 TRACK ORGANIZERS

Advanced Modelling for NDE

Mohammad Hafezi, Ph.D., *Oakland University*
Reza Alebrahim, Ph.D., *Neurointx LLC*

Design and Application of Metamaterials for Quantitative NDE/SHM

Sourav Banerjee, *University of South Carolina*

Digital Thread/Digital Twin/NDE Big Data

Steve Holland, *Iowa State University*

Eddy Current NDE

Matthew Cherry, *Air Force Research Lab*

Electromagnetic NDE Techniques

Saptarshi Mukherjee, *Lawrence Livermore National Laboratory*
Yiming Deng, *Michigan State University*

Guided Waves

Michael Lowe, *Imperial College, London*
Paul Fromme, *University College London*

Machine Learning and Statistical Methods in NDE

Joel B. Harley, *University of Florida*
Laura Homa, *University of Dayton Research Institute*
Daniel Sparkman, *Air Force Research Lab*

NDE for Additive Manufacturing

Peter D. Juarez, *NASA Langley Research Center*
Austin Downey, *University of South Carolina*
Sourav Banerjee, *University of South Carolina*

NDE for Civil Infrastructure

Anna Castellano, *Polytechnic University of Bari*
Aguinaldo Fraddosio, *Polytechnic University of Bari*

NDE Modeling and Prognostics for Composites

Dr. Cara A.C. Leckey, *NASA Langley Research Center*
Portia Banerjee, *[KBR], NASA Ames Research Center*

THANK YOU TO THE 2021 TRACK ORGANIZERS

NDE/SHM for Oil & Gas Industry

Yang Liu, *University of Wyoming*
Smaine Zeroug, *Schlumberger Doll Research*

NDE/SHM Systems and Signal Processing

Wieslaw Ostachowicz, *Polish Academy of Sciences, IFFM*
Maosen Cao, *Hohai University, Nanjing*

Nonlinear Ultrasonic Techniques

Christopher Kube, *Penn State University*
Lawrence J. Jacobs, *Georgia Tech*
Kathryn Matlack, *University of Illinois at Urbana-Champaign*

Nuclear Power NDE

Pradeep Ramuhalli, *Oakridge National Laboratory*
S. W. (Bill) Glass, *Pacific Northwest National Lab*

Resonant NDE

Sunil Kishore Chakrapani, *Michigan State University*
Matthew Cherry, *Air Force Research Lab*

Structural Health Monitoring

Olivier Mesnil, *CEA Tech, France*
Simon LaFlamme, *Iowa State University*
Austin Downey, *University of South Carolina*

Thermal Techniques for NDE

Xiaoyan Han, *Wayne State University*
Steve Holland, *Iowa State University*

Ultrasonic Arrays

Paul Wilcox, *University of Bristol*

Ultrasonic Scattering

Andrea Arguelles, *Penn State University*

Vibration Based NDE/NDT

Len Gelman, *The University of Huddersfield*

Posters

Henrique Reis, *University of Illinois at Urbana-Champaign*

SCHEDULE At-A-GLANCE

QNDE Day 1 - Wednesday, July 28, 2021 - Eastern Time					
WELCOME & OPENING PLENARY SESSION					
9:30 AM – 9:50 AM	**Live Welcome from Thomas COSTABILE P.E., Executive Director/CEO, ASME and Tribikram (Bikram) KUNDU, QNDE 2021 Conference Chair, University of Arizona**				
9:50 AM – 10:20 AM	**Plenary Speaker 1 - Prof. Dr. Walter ARNOLD, Saarland University** **Lecture Title:** *Non-Destructive Materials Characterization on a Small Scale Using Atomic Force Microscopy* - Introduced by Tribikram (Bikram) KUNDU, QNDE 2021 Conference Chair, University of Arizona				
10:20 AM – 10:35 AM	**Q&A with Prof. Dr. Walter ARNOLD, Saarland University**				
10:35 AM - 10:40 AM	***Short Break***				
10:40 AM - 11:25 AM	**CONCURRENT LIVE TECHNICAL TRACK PRESENTATIONS with Q&A**				
	01-01: Advanced Modelling for NDE	07-01: Machine Learning and Statistical Methods in NDE	10-01: NDE Modeling and Prognostics for Composites	18-01: Ultrasonic Arrays	05-01: Electromagnetic NDE Techniques
11:25 AM – 11:40 AM	***Break Time – Stretch your legs and connect with colleagues!***				
11:40 AM – 12:25 PM	**CONCURRENT LIVE TECHNICAL TRACK PRESENTATIONS with Q&A**				
	16-01: Structural Health Monitoring	18-02: Ultrasonic Arrays	09-01: NDE for Civil Infrastructure	06-01: Guided Waves	11-01: NDE/SHM for Oil & Gas Industry
12:25 PM – 12:35 PM	***Short Break***				
12:35 PM – 1:35 PM	**INDUSTRY PANEL: *Future Industry Opportunities and Gaps in NDE***				
1:35 PM – 1:50 PM	**Q&A with Industry Panelists**				
1:50 PM – 2:00 PM	***Short Break***				
2:00 PM – 2:45 PM	**CONCURRENT LIVE TECHNICAL TRACK PRESENTATIONS with Q&A**				
	13-01: Nonlinear Ultrasonic Techniques	06-02: Guided Waves	14-01: NDE for Nuclear Power	02-01: Design and Application of Metamaterials for Quantitative NDE/SHM	18-03: Ultrasonic Arrays
2:45 PM – 3:15 PM	**BREAKOUT NETWORKING FOR TECHNICAL PRESENTATIONS -** *Authors and attendees are invited to join a topic room to continue conversations and network.*				

QNDE Day 2 - Thursday, July 29, 2021 - Eastern Time					
WELCOME & PLENARY SESSION					
9:30 AM – 10:10 AM	**Welcome & Plenary Speaker 2 - Dr. Kara PETERS, North Carolina State University** Lecture Title: *Acoustic-Optical Interactions in Optical Fiber Sensors for Ultrasonic Inspection of Structures* **.** **Introduced by Prof. Henrique REIS, QNDE 2021 Conference Co-Chair, University of Illinois at Urbana-Champaign**				
10:10 AM – 10:25 AM	**Q&A with Dr. Kara PETERS, North Carolina State University** **Lecture Title***: Acoustic-Optical Interactions in Optical Fiber Sensors for Ultrasonic Inspection of Structures*				
10:25 AM – 10:30 AM	***Short Break***				
10:30 AM – 11:15 AM	**CONCURRENT LIVE TECHNICAL TRACK PRESENTATIONS with Q&A**				
	19-01: Ultrasonic Scattering	07-02: Machine Learning and Statistical Methods in NDE	11-02: NDE/SHM for Oil & Gas Industry	09-02: NDE for Civil Infrastructure	
11:15 AM – 11:30 AM	***Short Break***				
11:30 AM - 12:15 PM	**CONCURRENT LIVE TECHNICAL TRACK PRESENTATIONS with Q&A**				
	07-03: Machine Learning and Statistical Methods in NDE	08-01: NDE for Additive Manufacturing	14-02: NDE for Nuclear Power	06-03: Guided Waves	
12:15 PM – 12:20 PM	***Short Break***				
12:20 PM – 1:20 PM	**Next Frontiers of NDE & Prognostics Research and Funding Landscape Panel**				
1:20 PM – 1:35 PM	**Q&A with Industry Panelists**				
1:35 PM – 1:40 PM	***Short Break***				
1:40 PM – 2:05 PM	**SPECIAL LIVE Q&A SESSION with POSTER SUBMISSION AUTHORS** MODERATOR: Henrique REIS, QNDE 2021 Conference Co-Chair, University of Illinois at Urbana-Champaign				
2:05 PM – 2:50 PM	**CONCURRENT LIVE TECHNICAL TRACK PRESENTATIONS with Q&A**				
	04-01: Eddy Current NDE	11-03: NDE/SHM for Oil & Gas Industry	19-02: Ultrasonic Scattering	14-03: NDE for Nuclear Power	
2:55 PM – 3:25 PM	**BREAKOUT NETWORKING FOR TECHNICAL PRESENTATIONS -** *Authors and attendees are invited to join a topic room to continue conversations and network.*				

QNDE Day 3 - Friday, July 30, 2021 - Eastern Time					
9:30 AM – 9:45 AM	**Welcome to the Final Day by Dr. Yuris Dzenis, Chair of ASME's Nondestructive Evaluation Diagnosis Prognosis Division and Dr. Jeong-Beom (J-B) Ihn, Co-Chair of QNDE 2021**				
9:45 AM – 10:30 AM	**CONCURRENT LIVE TECHNICAL TRACK PRESENTATIONS with Q&A**				
	08-02: NDE for Additive Manufacturing	06-04: Guided Waves	11-04: NDE/SHM in Oil & Gas Industry	15-01: Resonant NDE	05-02: Electromagnetic NDE Techniques
10:30 AM – 10:45 AM	***Short Break***				
10:45 AM – 11:30 AM	**CONCURRENT LIVE TECHNICAL TRACK PRESENTATIONS with Q&A**				
	11-05: NDE/SHM for Oil & Gas Industry	06-05: Guided Waves	13-02 / 17-01: Nonlinear Ultrasonic Techniques (part 2) and Thermal Techniques for NDE	07-04: Machine Learning and Statistical Methods in NDE	16-02: Structural Health Monitoring
11:30 AM – 12:00 PM	**QNDE Awards Presentation & Conference Conclusion** Join us in congratulating the winners of the prestigious Founders Award and the 2020 Best Paper Awards and 2020 Outstanding Paper Awards				

https://event.asme.org/QNDE

2021 Plenary Speakers

Prof. Dr. W. Arnold
Department of Materials
Saarland University

Lecture Title: Non-Destructive Materials Characterization on a Small Scale Using Atomic Force Microscopy

Wednesday, July 28th at 9:50 AM EASTERN

Abstract: Since their invention now almost 40 years ago, atomic force microscopy (AFM) techniques have attracted vast attention for surface characterization of materials. There are many modes of operation for an AFM in order to measure mechanical, electrical, magnetic, and other properties, either in the attractive or repulsive regime. The ultrasonic atomic force microscopes are very much related to techniques used in non-destructive materials characterization. These techniques exploit the vibrational modes of AFM cantilevers which range from some kHz to several MHz. In these modes the cantilever vibrates in contact mode in one of its flexural or torsional resonances. Images can be obtained where the contrast depends on the local indentation modulus or local friction, which is evaluated quantitatively from the contact-resonance frequencies after calibration procedures. The lateral resolution at the surface is defined by the tip-sample contact radius ac, with typical values of 10 nm or less. Applications are presented of the AFM contact-resonance technique to measure the local elastic indentation modulus M and damping factor Q-1 in nanocrystalline materials, in metals with complicated microstructures, in shape-memory films, and in metallic glasses. The relation of Q-1 to the ultrasonic absorption will be discussed.

There were many efforts to establish ultrasonic AFM as a tool for subsurface ultrasonic imaging on a nanoscale. In particular, attention was paid to studies of the physical contrast mechanism based on contact mechanics, in order to enhance contrast and detection depth of subsurface features. A promising new path is based on using GHz ultrasonic waves which are amplitude-modulated at a cantilever contact-resonance. Due to the nonlinear contact forces, the signals can be demodulated and detected by the cantilever. The GHz carrier frequency enables for detecting contrast for small defects by ultrasonic scattering at depths much deeper than the deformation volume caused by Hertzian contact mechanics. Applications will be presented for detecting subsurface defects, including dislocations, voids and interfaces in functional materials and devices visualizing embedded inclusion, and imaging subcellular structures in biological materials. Finally, the similarity and the differences to the well-known Fokker bond test in NDE will be discussed.

Biography: online at https://event.asme.org/QNDE/Plenary-Speakers

Dr. Kara Peters
Department of Mechanical and Aerospace Engineering
North Carolina State University
Raleigh, NC, USA

Lecture Title: *Acoustic-Optical Interactions in Optical Fiber Sensors for Ultrasonic Inspection of Structures*

Thursday, July 29th at 9:30 AM EASTERN

Abstract: Fiber Bragg grating (FBG) sensor networks have many advantages for the measurement of Lamb waves in large structures for structural health monitoring applications. Amongst these are their immunity to corrosion and to electromagnetic interference. However, potentially their greatest advantage is the ability to multiplex a large number of sensors into a few optical fibers, permitting the coverage of a large area with reasonable a spatial density. Another advantage is the ability of optical fibers to carry multi-modal information. This information can be encoded in different optical modes in a multi-mode fiber or in different types of modes. For example, optical fibers have also recently been demonstrated to be excellent waveguide for acoustic modes. In particular, the longitudinal mode in an optical fiber is an excellent means to transport acoustic information along an optical fiber as it has low attenuation and is non-dispersive up to a frequencies of a few MHz.

This means that sensing does not have to be performed at the optical fiber is bonded to the structure, but instead Lamb waves can be converted into propagating acoustic modes in optical fibers. These modes can be transmitted to different sensor locations within the optical fiber. This presentation discusses the physical characteristics of these optical fiber acoustic modes and their use to increase the signal to noise ratio of the collection of Lamb wave information. Experimental verifications of the physical behavior of these modes using micro-laser Doppler vibrometry is also presented. Coupling of acoustic modes between multiple optical fibers will be discussed for sensor network applications.

Biography: online at https://event.asme.org/QNDE/Plenary-Speakers

Future Industry Opportunities and Gaps in NDE Panel

Wednesday, July 28th at 12:35 PM EASTERN

LIVE PANEL followed by audience Q&A

Dr. Jeong-Beom (J-B) Ihn
QNDE 2021 Conference Co-Chair and Technical Fellow and Technology Lead for Structural Health Management at Boeing Research & Technology
Seattle, Washington
Moderator

Dr. John C. Aldrin
Founder of Computational Tools
Panelist

Kevin McGushion
CEO, Exel Orbital Systems, Inc.
Panelist

Eskil Skoglund
Chief Research & Development Officer at DolphiTech
Panelist

Greg Sweers
Boeing Customer Support
Panelist

Panelists' Full Biographies can be found online at: https://event.asme.org/QNDE/Program/Industry-Panel

Next Frontiers of NDE & Prognostics Research and Funding Landscape Panel

Thursday, July 29th at 12:20 PM EASTERN

LIVE PANEL followed by audience Q&A

Dr. Yuris Dzenis
ASME 2020 IMECE Technical Chair
Chair of ASME's Nondestructive Evaluation Diagnosis Prognosis Division,
University of Nebraska-Lincoln
Moderator

Eric Burke
Nondestructive Evaluation Program Manager,
NASA Office of Safety and Mission Assurance
Panelist

Dr. Caglar Oskay
CMMI, NSF
Panelist

Dr. Jaimie Tiley
Oak Ridge National Lab
Panelist

Dr. Paul Wilcox
UK Research Center in NDE
and University of Bristol
Panelist

Panelists' Full Biographies can be found online at: https://event.asme.org/QNDE/Program/Research-Funding-Panel

WEDNESDAY, JULY 28, 2021

01-01: Advanced Modelling for NDE

7/28/2021
10:40 AM to 11:25 AM

Chair: ***Mohammad Hafezi - Oakland University***
Chair: ***Reza Alebrahim - Neurointx***
Presentations:

A 3d Spectral Finite Element Solution to Simulate Ultrasonic Inspection of Austenitic Welds, {QNDE2021-75232} *Abstract*
Nicolas LEYMARIE - CEA LIST
Alexandre Impériale - CEA LIST
Thibaud Fortuna - CEA LIST
Edouard Demaldent - CEA LIST

Developing a Displacement-Based Finite Element Formulation for Solid-Fluid Coupling Suitable for Gpu Calculations, {QNDE2021-75485} *Abstract*
Yiannis Simillides - Imperial College London
Peter Huthwaite - Imperial College London
Michal Kalkowski - Imperial College London
Michael Lowe - Imperial College London

Fem Simulation of Waves Excited by Array Probe Propagating in Centrifugally Cast Stainless Steel With Hexagonal Column, {QNDE2021-75766} *Abstract*
Shan Lin - Central Research Institute of Electric Power Industry
Yasushi Ikegami - ITOCHU Techno-Solutions Corporation

18-01: Ultrasonic Arrays

7/28/2021
10:40 AM to 11:25 AM

Chair: ***Paul Wilcox - University of Bristol***
Presentations:

Remote, Volumetric Ultrasonic Imaging of Defects Using Two-Dimensional Laser Induced Phased Arrays, {QNDE2021-74694} *Abstract*
Peter Lukacs - University of Strathclyde
Geo Davis - University of Strathclyde
Theodosia Stratoudaki - University of Strathclyde
Yashar Javadi - University of Strathclyde
Stephen Gareth Pierce - University of Strathclyde
Anthony Gachagan - University of Strathclyde

Adaptive Data Acquisition for Fast Ultrasonic Imaging Using Laser Induced Phased Arrays, {QNDE2021-75107} *Abstract*

Peter Lukacs - University of Strathclyde
Geo Davis - University of Strathclyde
Theodosia Stratoudaki - University of Strathclyde
Anthony Gachagan - University of Strathclyde

Optimization of Phased Array Elements for Photoacoustic Application Using Flexible Probe, {QNDE2021-75021} *Abstract*

Kun Wang - Tokyo Institute of Technology
Sohichi Hirose - Tokyo Institute of Technology

Improved Ultrasonic Phased Array Transmission Through Concave Surfaces, {QNDE2021-74576} *Abstract*

Jorge Franklin Mansur Rodrigues Filho - Ecole De Technologie Superieure - ETS Montreal
Pierre Belanger - Ecole de Technologie Superieure - ETS Montreal

Rayleigh Wave Excitation Method Using Ultrasonic Phased Arrays for the Detection of Surface Cracks, {QNDE2021-75083} *Abstract*

Bhupesh Verma - École de technologie supérieure ÉTS, Montreal, Quebec
Jorge Franklin Mansur Rodrigues Filho - École de technologie supérieure ÉTS, Montreal, Quebec
Pierre Belanger - École de technologie supérieure ÉTS, Montreal, Quebec

Steerability Study of a Phased Array Emat on Paramagnetic, Ferromagnetic and Magnetostrictive Materials, {QNDE2021-75157} *Abstract*

Jaime Parra Raad - Imperial College London
Frederic Cegla - Imperial College London

01-01: Advanced Modelling for NDE

7/28/2021
10:40 AM to 11:25 AM

Chair: ***Mohammad Hafezi - Oakland University***
Chair: ***Reza Alebrahim - Neurointx***

Presentations:

A 3d Spectral Finite Element Solution to Simulate Ultrasonic Inspection of Austenitic Welds, {QNDE2021-75232} *Abstract*

Nicolas LEYMARIE - CEA LIST
Alexandre Impériale - CEA LIST
Thibaud Fortuna - CEA LIST
Edouard Demaldent - CEA LIST

Developing a Displacement-Based Finite Element Formulation for Solid-Fluid Coupling Suitable for Gpu Calculations, {QNDE2021-75485} *Abstract*

Yiannis Simillides - Imperial College London
Peter Huthwaite - Imperial College London
Michal Kalkowski - Imperial College London
Michael Lowe - Imperial College London

Fem Simulation of Waves Excited by Array Probe Propagating in Centrifugally Cast Stainless Steel With Hexagonal Column, {QNDE2021-75766} *Abstract*

Shan Lin - Central Research Institute of Electric Power Industry
Yasushi Ikegami - ITOCHU Techno-Solutions Corporation

10-01: NDE Modeling and Prognostics for Composites

7/28/2021
10:40 AM to 11:25 AM

Chair: ***Portia Banerjee - NASA Ames Research Center [KBR]***
Chair: ***Cara Leckey - NASA Langley Research Center***

Presentations:

Analytical and Numerical Modeling of an Angle Beam Ultrasonic Nde System for Adhesive Bonds Evaluation in Multilayered Structures, {QNDE2021-68486} *Abstract*

Huijing He - University of California, Santa Cruz

Edge Illumination X-Ray Phase Contrast Imaging and Ultrasonic Attenuation for Porosity Quantification in Composite Structures, {QNDE2021-75009} *Abstract*

Dana Shoukroun - University College London
Sandro Olivo - University College London
Paul Fromme - UCL

Materials Characterization of Fiber Reinforced Plastic Using Polarized Shear Waves, {QNDE2021-75234} *Abstract*

Yannick Bernhardt - Institut für Kunststofftechnik, University of Stuttgart
Marc Kreutzbruck - Institut für Kunststofftechnik, University of Stuttgart

Investigation and Quantification of Internal Damage Propagation in Impacted Composite Plates Using Acoustic Contrast Tomograph, {QNDE2021-75233}

Technical Presentation Only

Fariha Mir - University of South Carolina
Sourav Banerjee - University of South Carolina
Karan Kodagali - University of South Carolina
Cyrus Vakili Rad - University of South Carolina
Subramani Sockalingam - University of South Carolina

07-01: Machine Learning and Statistical Methods in NDE

7/28/2021
10:40 AM to 11:25 AM

Chair: ***Joel Harley - University of Florida***
Chair: ***Daniel Sparkman - Air Force Research Laboratory***
Presentations:

Super-Resolution Imaging of Sub-Wavelength Crack-Like Defects With a Non-Contact Guided Wave Array: A Hierarchical Multi-Scale Deep Learning Approach, {QNDE2021-75058} *Abstract*
Homin Song - Michigan Technological University
Yongchao Yang - Michigan Technological University

Wave Physics-Informed Velocity Learning With Guided Waves, {QNDE2021-74828}
Technical Presentation Only
Joel B. Harley - University of Florida
Harsha Tetali - University of Florida

Multinominal Classification of Wall Thinning of Piping Using a Deep Neural Network Based on the Frequency Variation of Guided Wave Reflection Coefficients at Defect, {QNDE2021-74917} *Abstract*
Ryujin Katsuma - Tokushima university
Koki Hirano - Tokushima university
Motoki Goka - MITSUBISHI CHEMICAL
Masashi Ishikawa - Tokushima-university
Hideo Nishino - Tokushima university

Explainable Machine Learning for Damage Detection in Carbon Fiber Composite Plates Under Varying Temperature Conditions, {QNDE2021-75215} *Abstract*
Christopher Schnur - Saarland University
Jochen Moll - Goethe University of Frankfurt am Main
Yevgeniya Lugovtsova - Federal Institute for Materials Research and Testing (BAM)
Andreas Schütze - Saarland University
Tizian Schneider - Saarland University

05-01: Electromagnetic NDE Techniques

7/28/2021
10:40 AM to 11:25 AM

Chair: ***Saptarshi Mukherjee - Lawrence Livermore National Laboratory***
Chair: **Yiming Deng – *Michigan State University***
Presentations:

Evaluation of Adhesive Interface Properties in Honeycomb Sandwich Structure Using Guided Waves, {QNDE2021-74433} *Abstract*
Paramneer Negi - Indian institute of technology, Madras

Dileep Koodalil - Indian Institute of Technology, Madras
Krishnan Balasubramaniam - Indian Institute of Technology, Madras

Coplanar Capacitive Sensing as a New Electromagnetic Technique for Non-Destructive Testing, {QNDE2021-74739} *Abstract*
Farima Abdollahi Mamoudan - Laval University
Sebastien Savard - Eddyfi Technologies
Tobin Filleter - University of Toronto
Xavier Maldague - Laval University

Electrical Impedance Characterization for Damage Detection in Highly Conductive Additively Manufactured Metal Mesh Structures, {QNDE2021-74999} *Abstract*
Abigail Gilmore - Lawrence Livermore National Laboratory
Saptarshi Mukherjee - Lawrence Livermore National Laboratory
Tammy Chang - Lawrence Livermore National Laboratory
David Stobbe - Lawrence Livermore National Laboratory

Rigid-Flex Pcb Based Split-Ring Resonator Sensor for Near Field Microwave, {QNDE2021-75225} *Abstract*
Xiaodong SHI - Michigan State University
Subrata Mukherjee - Michigan State University
Jiaoyang Li - MSU
Srijan Datta - Michigan State University
Saptarshi Mukherjee -Lawrence Livermore National Laboratory
Lalita Udpa - Michigan State University
Cao Changyong - Michigan State University
Yiming Deng - Michigan State University

18-02: Ultrasonic Arrays

7/28/2021
11:40 AM to 12:25 PM

Chair: ***Paul Wilcox - University of Bristol***
Presentations:

Performances Evaluation of Instantaneous Frequency Imaging for Specular Reflectors and Multi-View Ultrasonic Inspection, {QNDE2021-74580} *Abstract*
Baptiste Gauthier - École de Technologie Supérieure
Guillaume Painchaind-April - Olympus NDT Canada
Alain Le Duff - Olympus NDT Canada
Pierre Bélanger - École de Technologie Supérieure

Minimum Transmission Events for Fast Ultrasonic Imaging Using Sparse-Tfm Approaches, {QNDE2021-75199} *Abstract*
Lucas Pereira Piedade - École de technologie supérieure

Guillaume Painchaud-April - Olympus NDT Canada
Alain Le Duff - Olympus NDT Canada
Pierre Bélanger - École de technologie supérieure

Hybrid Geometrical Full Waveform Inversion for Accurate Defect Characterisation, {QNDE2021-74984} *Abstract*
Xiao YIN - The Hong Kong University of Science and Technology
Fan Shi - The Hong Kong University of Science and Technology

Real-Time 3-D Ultrasonic Array Imaging in the Fourier-Domain: Evaluation on a Lattice of Spherical Mircroporosities Produced by Additive Manufacturing, {QNDE2021-75154} *Abstract*
Maxance Marmonier - CEA
Sébastien Robert - CEA
Jérome Laurent - CEA
Claire Prada - CNRS

16-01: Structural Health Monitoring

7/28/2021
11:40 AM to 12:25 PM

Chair: ***Olivier Mesnil - CEA***
Chair: ***Austin Downey - University of South Carolina***
Presentations:

Structural Health Monitoring (Shm) – a Testia Perspective, {QNDE2021-74985}
Technical Presentation Only
Aswin Haridas - Testia, An Airbus Company
Holger Speckmann - Testia, An Airbus Company

Quadrature Amplitude Modulation for Acoustic Data Communication in Ultrasonic Structural Health Monitoring Systems, {QNDE2021-74543} *Abstract*
Jochen Moll - Goethe University Frankfurt
Octavio Marquez Reyes - Goethe University Frankfurt
Federica Zonzini - University of Bologna
Masoud Mohammadgholiha - University of Bologna
Luca De Marchi - University of Bologna

A Comparison of Multiple Learning Methods for Guided Wave Compression and Representation, {QNDE2021-75047} *Abstract*
KANG YANG - University of Florida
Yidi Huang - University of Florida
Ziqian Huang - University of Florida
Sungwon Kim - University of Utah
Joel B. Harley - University of Florida

Improved Non-Destructive Evaluation Based Defect Detection Using Pixel Level Data Fusion, {QNDE2021-75237} *Abstract*

Subrata Mukherjee - Michigan State University
Xuhui Huang - Michigan State University
Lalita Udpa - Michigan State University
Yiming Deng - Michigan State University

Development of a Convolutional Lstm Network Assisted Fibre Optics Based Passive Structural Health Monitoring System, {QNDE2021-75192} *Abstract*

Ainulla Khan - Indian Institute of Technology Madras
Krishnan Balasubramaniam - Indian Institute of Technology Madras

Nonlinear Compressed Sensing Applied to Guided Wave Tomography for the Reconstruction of Corrosion in Structural Health Monitoring Applications, {QNDE2021-75121} *Abstract*

Arthur Waguet - CEA LIST
Tom Druet - CEA LIST
Olivier Mesnil - CEA LIST
Philippe Ciuciu - CEA NeuroSpin

06-01: Guided Waves

7/28/2021
11:40 AM to 12:25 PM

Chair: ***Paul Fromme - UCL***
Chair: ***Michael Lowe - Imperial College London***

Presentations:

Acoustic Forward Model for Guided Wave Propagation Around a Pipe Bend, {QNDE2021-75104} *Abstract*

Carlos Omar Rasgado Moreno - Tallinn University of Technology
Madis Ratassepp - Tallinn University of Technology

Guided Wave Plane Wave Imaging for High Resolution Short Range Pipe Inspection of Inaccessible Locations, {QNDE2021-75515} *Abstract*

Filip Szlaszynski - Imperial College London
Michael Lowe - Imperial College London
Peter Huthwaite - Imperial College London

Efficient Hybrid Fe/modal Simulation of Gw Inspection of Corroded Elbow Pipes With Emat, {QNDE2021-75921} *Abstract*

Vahan Baronian - CEA - List
Philippe Guy - LVA

11-01: NDE/SHM for Oil & Gas Industry

7/28/2021
11:40 AM to 12:25 PM

Chair: ***Yang Liu - University of Wyoming***
Presentations:

Novel Guided Wave Inspection Opportunities for Oil and Gas Structures Based on Material Nonlinearity, {QNDE2021-74914} *Abstract*
Cliff Lissenden - Penn State Univ
Anurup Guha - Penn State

Fast Inversion Tomography for Quantitative Corrosion Detection, {QNDE2021-75313} *Abstract*
Min Lin - University of Wyoming
Yang Liu - Tianjin University
Xiaocen Wang - Tianjin University
Junkai Tong - Tianjin University

A Novel Probability of Detection Assessment Considering Model Uncertainty for Lamb Wave Detection, {QNDE2021-74014} *Abstract*
Chenjun Gao - Beihang University
Jingjing He - Beihang University
Xuefei Guan - Graduate School of China Academy of Engineering Physics

Comparative Analysis of Collocated and Non-Collocated Pulsed Eddy Current Sensing for Multi-Casing Evaluation, {QNDE2021-74675} *Abstract*
Saad Omar - Schlumberger-Doll Research Center

Joint Inversion of Audio-Magnetotelluric and Seismic Travel Time Data Based on Deep Learning Constraint, {QNDE2021-75164} *Abstract*
Hongyu Zhou - Tsinghua University
Rui Guo - Tsinghua University
Maokun Li - Tsinghua University
Fan Yang - Tsinghua University
Shenheng Xu - Tsinghua University
Aria Abubakar - Schlumberger

09-01: NDE for Civil Infrastructure

7/28/2021
11:40 AM to 12:25 PM

Chair: ***Anna Castellano - Polytechnic University of Bari***
Chair: ***Aguinaldo Fraddosio - Polytechnic University of Bari***
Presentations:

Stress Monitoring in a Real-Size Reinforced Concrete Column Using Torsional Resonance, {QNDE2021-73958} *Abstract*

Agustin Spalvier - Universidad de la Republica
Santiago Laco - Universidad de la Republica
Gonzalo Cabrera - Universidad de la Republica
Gonzalo Cetrangolo - Universidad de la Republica

Non-Destructive Tests for the Assessment of r.c. Buildings, {QNDE2021-74922}
Abstract

Mariella Diaferio - Politecnico di Bari
Michele Vitti - freelance

Non-Invasive Monitoring System for Historical Building, {QNDE2021-74989} *Abstract*

Carmelo Scuro - University of Calabria- Department of Physics
Domenico Luca Carnì - University of Calabria - Department of Computer, Modeling, Electronics, and Systems Engineering (DIMES)
Giuseppe Alì - Department of Physics- University of Calabria
Francesco Lamonaca - University of Calabria - Department of Computer, Modeling, Electronics, and Systems Engineering (DIMES)
Renato S. Olivito - Department of Civil Engineering - University of Calabria
Gabriele Milani - Department of Architecture, Built Environment and Construction Engineering ABC Technical University of Milan

Extraction of Timber Properties Parameters of Historical Building, {QNDE2021-75039}
Technical Presentation Only

Peixuan Wang - Politecnico di Milano
Shengcai Li - Yangzhou University
Gabriele Milani - Politecnico di Milano

On the Assessment of Masonry Structures, {QNDE2021-75028} *Abstract*

Mariella Diaferio - Politecnico di Bari
Marilena Venerito - freelance
Michele Vitti - freelance

18-03: Ultrasonic Arrays

7/28/2021
2:00 PM to 2:45 PM

Chair: ***Paul Wilcox - University of Bristol***
Presentations:

Adaptive Tfm Approach for Turbine Blade Testing in a Nde 4.0 Environment, {QNDE2021-75197} *Abstract*

Thomas Heckel - BAM Bundesanstalt für Materianforschung und -prüfung
Christian Hassenstein - BAM

Rainer Boehm - BAM
Jens Prager - BAM

2-D Numerical Studies of Full Waveform Inversion Based Inclusion Imaging in Gears, {QNDE2021-72402} *Technical Presentation Only*
Jiaze He - University of Alabama
Jing Rao - Technical University of Munich
Jacob Flemming - University of Alabama
Hom Nath Gharti - Queen's University
Luan Nguyen - BAUER Spezialtiefbau GmbH
Gaines Morrison - University of Alabama

Rough Defect Detection With Focusing Phased Array Inspection, {QNDE2021-75278} *Technical Presentation Only*
John Jian - EDF Energy

A Comparison Study of Several Ultrasonic Endoscopy Technology for Tubes' Inspection, {QNDE2021-75025} *Abstract*
Ze Xi - Tsinghua University
Xiangang Wang - Tsinghua University
Xiaowei Luo - Tsinghua University

Weld Map Tomography for Improving Array Images of Complex Welds, {QNDE2021-75907} *Technical Presentation Only*
Michal K. Kalkowski - Imperial College London
Michael Lowe - Imperial College London

14-01: NDE for Nuclear Power

7/28/2021
2:00 PM to 2:45 PM

Chair: ***Pradeep Ramuhalli - Oak Ridge National Laboratory***
Chair: ***Bill Glass - PNNL***

Presentations:

Transition to Online Cable Insulation Condition Monitoring, {QNDE2021-75014} *Abstract*
Mychal Spencer - Pacific Northwest National Laboratory
Leonard Fifield - Pacific Northwest National Laboratory
Bill Glass - Pacific Northwest National Laboratory

Results of a Virtual Round Robin Study to Estimate Probability of Detection for Dissimilar Metal Welds, {QNDE2021-75055} *Abstract*
Ryan Meyer - Pacific Northwest National Laboratory
Aimee Holmes - Pacific Northwest National Laboratory

Romarie Morales - Pacific Northwest National Laboratory
Iikka Virkkunen - Aalto University
Thiago Seuaciuc-Osorio - Electric Power Research Institute
Bruce Lin - Nuclear Regulatory Commission

Feasibility of Lead Fast Reactor Heat Exchanger Tube On-Line Monitoring, {QNDE2021-76573} *Abstract*
Samuel W Glass - Pacific Northwest National Laboratory
Morris S. Good - Pacific Northwest National Laboratory

02-01: Design and Application of Metamaterials for Quantitative NDE/SHM

7/28/2021
2:00 PM to 2:45 PM

Chair: ***Sourav Banerjee - University of South Carolina***
Chair: ***Saman Farhangdoust - Florida International University***

Presentations:

Design of Passive and Active Metamaterial Lens for Subwavelength Microwave Detection, {QNDE2021-75078} *Abstract*
Srijan Datta - Michigan State University
Xiaodong Shi - Michigan State University
Saptarshi Mukherjee - Lawrence Livermore National Laboratory
Yiming Deng - Michigan State University
Lalita Udpa - Michigan State University

Manipulating the Torsional Mode With the Gradient-Index Phononic Crystal Lens, {QNDE2021-75222} *Technical Presentation Only*
Gorkem Okudan - University of Illinois at Chicago
Hrishikesh Danawe - University of Michigan
Serife Tol - University of Michigan
Didem Ozevin - University of Illinois at Chicago

Hybrid Bessel Beam and Metamaterial Lenses for Deep Laparoscopic Nondestructive Evaluation, {QNDE2021-75292} *Technical Presentation Only*
Hossain Ahmed - University of South Carolina
Susanta Ghosh - Michigan Technological University
Trisha Sain - Michigan Technological University
Sourav Banerjee - University of South Carolina

Ultrasonic Bessel Beams Generation Using Acoustic Axicon in the Inspection of Multilayered Structures and Attenuative Material Systems, {QNDE2021-75390}
Abstract
Mustahseen Indaleeb - University of South Carolina
Sourav Banerjee - University of South Carolina

Shawn Beard - Advent Innovations Limited

Studies on a Novel Hyperlens Concept for Ultrasonic Nondestructive Evaluation, {QNDE2021-76072} *Abstract*

PRADEEP KUMAR - Indian Institute of Technology (IIT MADRAS)
Mohamed Subair Syed Akbar Ali - Indian Institute of Technology (IIT Madras)
Prabhu Rajagopal - Indian Institute of Technology (IIT Madras)

06-02: Guided Waves

7/28/2021
2:00 PM to 2:45 PM

Chair: ***Paul Fromme - UCL***
Chair: ***Michael Lowe - Imperial College London***

Presentations:

Reconstruction of the Remnant Thickness Circumferential Profile of a Steel Pipe Using High Order Shear Horizontal Waves and Emats, {QNDE2021-75158} *Abstract*

Aurelien Thon - Ecole De Technologie Superieur
Alain Le Duff - Olympus NDT Canada
Guillaume Painchaud-April - Olympus NDT Canada
Pierre Belanger - Ecole De Technologie Superieur

Shear Horizontal Guided Wave Corrosion Detection and Quantification in Pipes via Linear Scanning Magnetostrictive Transducers (Mst), {QNDE2021-75249} *Abstract*

Xin Chen - Southwest Research Institute
Sergey Vinogradov - Southwest Research Institute
Adam Cobb - Southwest Research Institute

Quantitative Guided Wave Thickness Mapping Using Geometrical Full Waveform Inversion, {QNDE2021-75615} *Abstract*

Peng Zuo - Imperial College London
Peter Huthwaite - Imperial College London

Passive Guided Waves Tomography Applied to the Shm of Pipes, {QNDE2021-75118} *Abstract*

Tom Druet - CEA LIST
Bastien Chapuis - CEA LIST

Inspection of Nuclear Assets With Limited Access, {QNDE2021-72887} *Abstract*

Euan Foster - University of Strathclyde
Charles Macleod - University of Strathclyde

Characterization of Roll-Cladded Aluminum Plates With Laser-Based Surface-Acoustic-Wave Measurements, {QNDE2021-74927} *Abstract*

Clemens Grünsteidl - RECENDT
Georg Watzl - Research Center for Non-Destructive Testing GmbH
Christian Kerschbaummayr - Research Center for Non-Destructive Testing GmbH
Edgar Scherleitner - Research Center for Non-Destructive Testing GmbH
Günther Mayr - FH OÖ Forschungs & Entwicklungs GmbH
Marin Petre - Vimetco Alro

13-01: Nonlinear Ultrasonic Techniques

7/28/2021
2:00 PM to 2:45 PM

Chair: ***Christopher Kube - The Pennsylvania State University***
Chair: ***Kathryn Matlack - University of Illinois Urbana-Champaign***
Chair: ***Contact: Laurence Jacobs - Georgia Institute of Technology***

Presentations:

Evaluating the Degree of Nonlinearity by Applying the Nonlinear Spc-I Technique in the Fem Simulation of Materials With Breathing Cracks, {QNDE2021-74617} *Abstract*

SeHyuk Park - The University of Arizona
Hamad Alnuaimi - The University of Arizona
Umar Amjad - The University of Arizona
Tribikram Kundu - The University of Arizona

Theoretical and Experimental Study of the Cubic Nonlinear Parameter for Metallic Materials, {QNDE2021-74684} *Abstract*

Hyunjo Jeong - Wonkwang University

Feasibility Study of Nonlinear Rayleigh Wave for Evaluation of Rolling Contact Fatigue, {QNDE2021-75056} *Abstract*

Changgong Kim - University of Illinois At Urbana-Champaign
Yaswanth Sai Jetti - UIUC
Alison Dunn - UIUC
Kathryn Matlack - UIUC

Second Harmonic Generation in Pressure Vessel Steel Fatigued in Hydrogen, {QNDE2021-75226} *Abstract*

Matthew Webster - Luna Innovations
Kennet Castillo - Luna Innovations
Chris San Marchi - Sandia National Lab

Joseph Ronevich - Sandia National Lab
Brian Kagay - Sandia National Lab

Nonlinear Acoustics for Non-Destructive Evaluation of Materials Tensile Strength, {QNDE2021-75235} *Abstract*

Julian Ehrler - Institut für Kunststofftechnik, University of Stuttgart
Alexander Solodov - National University of Science and Technology (MISIS)
Yannick Bernhardt - Institut für Kunststofftechnik, University of Stuttgart
Marc Kreutzbruck - Institut für Kunststofftechnik, University of Stuttgart

THURSDAY, JULY 29, 2021

19-01: Ultrasonic Scattering

7/29/2021
10:30 AM to 11:15 AM

Chair: ***Andrea Arguelles - Penn State University***

Presentations:

Characterising Grain Statistics in Castings Using Ultrasonic Measurements, {QNDE2021-75903} *Technical Presentation Only*

Michal K. Kalkowski - Imperial College London
Yuan Liu - Imperial College London
Michael Lowe - Imperial College London
Ming Huang - Imperial College London
Vykintas Samaitis - Kaunas University of Technology
Vaidotas Cicenas - Kaunas University of Technology
Andreas Schumm - EDF R&D

Finite Element Modelling of Effective Surface Acoustic Wave Propagation in a Digital Twin of a Polycrystalline Aluminum Sample, {QNDE2021-75216} *Abstract*

Martin Ryzy - Research Center for Non Destructive Testing
Tomáš Grabec - Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering

Elastic Wave Propagation in Strongly Scattering Polycrystals: Finite Element and Semi-Analytical Study, {QNDE2021-75115} *Abstract*

Ming Huang - Imperial College London
Peter Huthwaite - Imperial College London
Stanislav Rokhlin - The Ohio State University
Michael Lowe - Imperial College London

Ultrasonic Dispersion and Attenuation of Strong Scattering Metal and Polycrystalline Materials, {QNDE2021-75081} *Abstract*

Huijing He - University of California, Santa Cruz

2d Finite Element Modelling for Ultrasonic Attenuation Measurement in Polycrystalline Media, {QNDE2021-75084} *Technical Presentation Only*

Wei Yi Yeoh - Imperial College London
Bo Lan - Imperial College London
Ming Huang - Imperial College London
Stanislav Rokhlin - The Ohio State University
Michael Lowe - Imperial College London

11-02: NDE/SHM for Oil & Gas Industry

7/29/2021
10:30 AM to 11:15 AM

Chair: ***Yang Liu - University of Wyoming***

Presentations:

Research on Composite Electromagnetic Ultrasonic Transducer Integrating Thickness Measurement and Guided Wave Detection, {QNDE2021-74981} *Abstract*

Zhifeng Tang - Instrument Science and Technology, Zhejiang University
Chao Qian - Department of Mechanical, Zhejiang University

Measuring Thickness and Shear Wave Speed in Pipeline Using Sh Guided Waves, {QNDE2021-74627} *Abstract*

Yunfei Long - Jilin University
Zhiwen Cui - Jilin University
Weihao Wang - Jilin University
Jinxia Liu - Jilin University
Tribikram Kundu - University of Arizona

Guided Wave Imaging Based on Convolutional Neural Network for Quantitative Corrosion Assessment, {QNDE2021-75020} *Abstract*

Xiaocen Wang - Tianjin University
Min Lin - University of Wyoming
Junkai Tong - Tianjin University
Jian Li - Tianjin University
Zhoumo Zeng - Tianjin University
Yang Liu - Tianjin University

Experimental Research on Steel Stress Measurement Based on Magneto-Elastic Effects, {QNDE2021-74974} *Abstract*

Qian Chen - Tianjin University
Xinjing Huang - Tianjin University
Yutian Yan - Tianjin University
Jian Li - State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University
Yu Zhang - State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University

Hao Feng - State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University

Calculation and Characteristic Research of Partial Waves in Cased Borehole, {QNDE2021-75062} *Abstract*

Rao Bo - China University of Petroleum
Su Yuanda - China University of Petroleum
Tang Xiaoming - China University of Petroleum

07-02: Machine Learning and Statistical Methods in NDE

7/29/2021
10:30 AM to 11:15 AM

Chair: ***Joel Harley - University of Florida***
Chair: ***Daniel Sparkman - Air Force Research Laboratory***

Presentations:

Domain Adapted Deep-Learning for Improved Ultrasonic Crack Characterization Using Limited Experimental Data, {QNDE2021-74334} *Technical Presentation Only*

Richard Pyle - University of Bristol
Rhodri Bevan - University of Bristol
Rob Hughes - University of Bristol
Amine Ait Si Ali - Baker Hughes
Paul Wilcox - University of Bristol

Application of Machine Learning to Multi-Modal Tfm Imaging for the Characterization of Crack-Like Defects in the Presence of Uncertainties on the Characteristics in Welds, {QNDE2021-75132} *Abstract*

Roberto Miorelli – CEA
Sébastien Robert - CEA, List
Stéphane Leberre - CEA, List
Pierre Calmon - CEA, List

Application of Artificial Intelligence for Automated Detection of Defects in Nuclear Energy Domain, {QNDE2021-74889} *Abstract*

Eleftherios Anagnostopoulos - INTERCONTROLE - FRAMATOME
Yann Kernin - INTERCONTROLE - FRAMATOME

Benefit of Neural Network for the Optimization of Defect Detection on Composite Material Using Ultrasonic Non Destructive Testing, {QNDE2021-75925} *Abstract*

Pauline Trouvé-Peloux - ONERA
Camille Trottier - ONERA
Baptiste Abeloos - ONERA
Jean-Michel Roche - ONERA

Detection and Characterisation of Defects in Multi-View Ultrasonic Imaging Using Machine Learning, {QNDE2021-74921} *Abstract*

Rhodri Bevan - University of Bristol
Anthony Croxford - University of Bristol

09-02: NDE for Civil Infrastructure

7/29/2021
10:30 AM to 11:15 AM

Chair: ***Anna Castellano - Polytechnic University of Bari***
Chair: ***Aguinaldo Fraddosio - Polytechnic University of Bari***

Presentations:

Directional Sensitivity of the Acoustoelastic Effect in Uniaxially Prestressed Materials, {QNDE2021-74641} *Abstract*

Anna Castellano - Polytechnic University of Bari
Aguinaldo Fraddosio - Polytechnic University of Bari
Tribikram Kundu - The University of Arizona

A Systematic Approach to Develop Linear and Nonlinear Tomography With Single Measurement, {QNDE2021-74890} *Abstract*

Tonghao Zhang - university of Illinois at Chicago
Didem Ozevin - University of Illinois at Chicago

Preliminary Acoustic Study of 3D Localization of Buried Pipe., {QNDE2021-74945} *Abstract*

William Xerri - CNRS-UMR7330 CEREGE
Gineth Saracco - CNRS-UMR7330 CEREGE
Ghislain Gassier - CNRS-UMR7330 CEREGE
Laurent Zomero - MADE-SA
Philippe Picon - MADE-SA

A Remote Solitary Wave–based Technique for Monitoring Corrosion in Steel Structures: Numerical Analysis and Experimental Validation, {QNDE2021-74950} *Abstract*

Hoda Jalali - University of Pittsburgh
Piervincenzo Rizzo - University of Pittsburgh

High-Speed Inspection of Rails by Output-Only Ultrasonic Monitoring, {QNDE2021-75034} *Abstract*

Francesco Lanza Di Scalea - University of California San Diego
Diptojit Datta - University of California San Diego
Izabela Batista - University of California San Diego
Ali Hosseinzadeh - Univ of California San Diego

08-01: NDE for Additive Manufacturing

7/29/2021
11:30 AM to 12:15 PM

Chair: ***Peter Juarez - NASA***
Chair: ***Austin Downey - University of South Carolina***

Presentations:

Optimization of Virtual Source Aperture Imaging for Dry-Coupled Roller-Probe Inspection of As-Built Waam Components, {QNDE2021-74716} *Abstract*

Rastislav Zimermann - University of Strathclyde
Ehsan Mohseni - University of Strathclyde
David Lines - University of Stratclyde
Randika Vithanage - University of Strathclyde
Charles Macleod - University of Strathclyde
Stephen Pierce - University of Strathclyde
Anthony Gachagan - University of Strathclyde
Stewart Williams - Cranfield University
Jialou Ding - Cranfield University

Real-Time Laser Ultrasonic Monitoring of Laser Induced Heating and Melting Processes, {QNDE2021-74911} *Abstract*

Rosa Morales - University of Colorado, Boulder
Kathryn Harke - Lawrence Livermore National Laboratory
Joseph Tringe - Lawrence Livermore National Laboratory
David Stobbe - Lawrence Livermore National Laboratory
Todd Murray - University of Colorado, Boulder

A Bespoke Phased Array Inspection System Development Intended for Automated In-Process Inspection of Wire + Arc Additive Manufacturing (Waam), {QNDE2021-75109}
Abstract

Ehsan Mohseni - University of Strathclyde
Randika K. W. Vithange - University of Strathclyde
Rastislav Zimermann - University of Strathclyde
Charles N. Macleod - University of Strathclyde
Charalampos Loukas - University of Strathclyde
Momchil Vasilev - University of Strathclyde
David Lines - University of Strathclyde
Yashar Javadi - University of Strathclyde
Stephen G. Pierce - University of Strathclyde
Anthony Gachagan - University of Strathclyde
Stewart Williams - Cranfield University
Jialuo Ding - Cranfield University

Defect Detection in Additively Manufactured Parts by Laser Ultrasonics, {QNDE2021-75112} *Abstract*

Mike Hettich - Research Center for Non-Destructive Testing GmbH
Bernhard Reitinger - Research Center for Non-Destructive Testing GmbH
Georg Watzl - Research Center for Non-Destructive Testing GmbH
Klarissa Meirer - Research Center for Non-Destructive Testing GmbH
Markus Hatzenbichler - FOTEC Forschungs- und Technologietransfer GmbH
Sascha Senck - University of Applied Sciences Upper Austria
Edgar Scherleitner - Research Center for Non-Destructive Testing GmbH,

Towards Online Structural Validation for Fused Filament Fabrication, {QNDE2021-75221} *Abstract*

Yanzhou Fu - UNIVERSITY OF SOUTH CAROLINA
Avery Pratt - Naval Surface Warfare Center (Crane Division)
Yunusa Balogun - Naval Surface Warfare Center (Crane Division)
Lang Yuan - langyuan@cec.sc.edu
Austin Downey - austindowney@sc.edu

06-03: Guided Waves

7/29/2021
11:30 AM to 12:15 PM

Chair: ***Paul Fromme - UCL***
Chair: ***Michael Lowe - Imperial College London***

Presentations:

Directional Features of Guided Waves Propagating in a Honeycomb Sandwich Structure, {QNDE2021-75053} *Abstract*

Lifu Wang - University of California, Los Angeles
Leonardo Araque - University of California, Los Angeles
Steffen Tai - University of California, Los Angeles
Ajit Mal - University of California, Los Angeles
Christoph Schaal - California State University, Northridge

Modelling Anisotropy Influence on Guided Wave Scattering at Composite Delaminations, {QNDE2021-74591} *Abstract*

Flora Hervin - UCL
Paul Fromme - UCL

Identification of the Orthotropic Elastic Tensor of Composites Using Full Field Lamb Wave Energy Velocities and Dispersion Curves, {QNDE2021-75067} *Abstract*

Adil Han Orta - KU Leuven
Shain Azadi - Politecnico di Bari
Joost Segers - Ghent University
Nicolaas Bernardus Roozen - KU Leuven

Wim Van Paepegem - Ghent University
Mathias Kersemans - Ghent University
Koen Van Den Abeele - Ku Leuven

Numerical Analysis of Guided Wave Transmission Through a Long Defect in a Rail Track, {QNDE2021-74992} *Abstract*
Philip Loveday - University of the Witwatersrand
Craig Long - CSIR, Manufacturing Cluster

A Study of Rayleigh Wave Attenuation Due to Surface Roughness, {QNDE2021-74703}
Technical Presentation Only
Georgios Sarris - Imperial College London
Stewart G Haslinger - University of Liverpool
Peter Huthwaite - Imperial College London
Peter B Nagy - University of Cincinnati
Michael J S Lowe - Imperial College London

14-02: NDE for Nuclear Power

7/29/2021
11:30 AM to 12:15 PM

Chair: ***Joe Wall, Electric Power Research Institute***
Chair: ***Pradeep Ramuhalli - Oak Ridge National Laboratory***
Presentations:

Combined Linear and Nonlinear Ultrasound to Examine Microstructural and Microchemical Variations in Highly Irradiated 304 Stainless Steel, {QNDE2021-75046}
Technical Presentation Only
Contact: Laurence Jacobs - Georgia Institute of Technology
Jin-Yeon Kim - Georgia Tech
Joe Wall - EPRI
Frank Garner - DSL Extreme

Thermoelectric Nde for Characterization of Fracture Properties of Mechanically Embrittled Austenitic Stainless Steel, {QNDE2021-74516} *Technical Presentation Only*
Peter B. Nagy - University of Cincinnati
Ethan Robinson - University of Cincinnati

Characterization of Fracture Properties of Embrittled Austenitic Stainless Steels Using Nonlinear Ultrasound, {QNDE2021-75045} *Technical Presentation Only*
Contact: Laurence Jacobs - Georgia Institute of Technology

Nondestructive Assessment of Fracture Toughness in Stainless Steels – Fusion of Nde Techniques, {QNDE2021-74891} *Abstract*
Maria Guimaraes - EPRI

Thiago Seuaciuc-Osorio – EPRI
Joe Wall - EPRI

07-03: Machine Learning and Statistical Methods in NDE

7/29/2021
11:30 AM to 12:15 PM

Chair: ***Joel Harley - University of Florida***
Chair: ***Daniel Sparkman - Air Force Research Laboratory***

Presentations:

Baseline Signal Learning for Sstdr Fault Detection in Photovoltaic Strings, {QNDE2021-74402} *Abstract*
Cody LaFlamme - University of Florida
Cynthia Furse - University of Utah
Ayobami Edun - University of Florida
Evan Benoit - University of Utah
Michael Scarpulla - University of Utah
Joel Harley - University of Florida

Artefact Identification and Suppression for Ultrasonic Nde Data Using a Model-Assisted Deep Learning Approach, {QNDE2021-74647} *Abstract*
Sergio Cantero-Chinchilla - University of Bristol
Paul D. Wilcox - University of Bristol
Anthony J. Croxford - University of Bristol

A Fast Unsupervised Online Learning Algorithm to Detect Structural Damage in Time-Varying Environments, {QNDE2021-75247} *Abstract*
Karthik Gopalakrishnan - Oregon State University
V John Mathews - Oregon State University

Health Monitoring of Solar Arrays With Spread Spectrum Time Domain Reflectometry and Variational Autoencoders, {QNDE2021-75211} *Abstract*
AYOBAMI EDUN - University of Florida
Cody Laflamme - University of Florida
Michael Scarpulla - University of Utah
Cynthia Furse - University of Utah
Joel Harley - University of Florida

Autoencoder-Based Anomaly Detection in Industrial X-Ray Images, {QNDE2021-74428} *Abstract*
Erik Lindgren - University West
Christopher Zach - Chalmers University

Enhancing Vibration-Based Structural Health Monitoring via Edge Computing: A Tiny Machine Learning Perspective, {QNDE2021-75153} *Abstract*

Federica Zonzini - University of Bologna
Antonio Carbone - University of Bologna

Francesca Romano - Univerisity of Bologna
Matteo Zauli - University of Bologna
Luca De Marchi - University of Bologna

21-01: Posters

7/29/2021
1:40 PM to 2:05 PM - Posters

Chair: ***Henrique Reis - University of Illinois***

Presentations:

Improved Detection of Surface Defects Located at the Edge of a Sample Using High Frequency Eddy Current Amplitude and Phase Measurements, {QNDE2021-74896}
Poster

Amanda To - Warwick University
Zhichao Li - Warwick University
Steve Dixon - Warwick University

Determination of the Ultrasonic Velocity on a Recent and Aged Pine Wood, {QNDE2021-74998} *Poster*

Mayra Carrillo - UNIVERSIDAD MICHOACANA
Hector Carreon - UNIVERSIDAD MICHOACANA

Detection of Segregation in a High Carbon Steel by Non Destructive Techniques, {QNDE2021-75006} *Poster*

Hector Carreon - UNIVERSIDAD MICHOACANA
Luis Hernández - UNIVERSIDAD MICHOACANA
Arnoldo Bedolla - UNIVERSIDAD MICHOACANA

19-02: Ultrasonic Scattering

7/29/2021
2:05 PM to 2:55 PM

Chair: ***Andrea Arguelles - Penn State University***

Presentations:

Scattering of Ultrasound by Rough Defects for Ultrasonic Time-of-Flight Diffraction Inspection, {QNDE2021-74947} *Technical Presentation Only*

Stewart Haslinger - University of Liverpool

Michael Lowe - Imperial College London
Zhengjun Wang - Hong Kong University of Science and Technology
Fan Shi - Hong Kong University of Science and Technology

Sizing Rough Defects Using Time-of-Flight Diffraction Inspection, {QNDE2021-75066} *Abstract*
Zhengjun Wang - HKUST
Fan Shi - HKUST
Stewart Haslinger - University of Liverpool
Michael Lowe - Imperial College London

A New Twist on Hardening Depth Measurements by Laser Ultrasonics, {QNDE2021-75200} *Abstract*
Wolfgang Haderer - Research Center for Non-Destructive Testing GmbH
Jens Gseller - Maschinenfabrik ALFING Kessler GmbH
Edgar Scherleitner - Research Center for Non-Destructive Testing GmbH
Bernhard Reitinger - Research Center for Non-Destructive Testing GmbH
Mike Hettich - Research Center for Non-Destructive Testing GmbH

Determination of the Case Depth by Ultrasonic Backscatter of Case and Induction Hardened Steel With a Soft Hardness Gradient., {QNDE2021-74995} *Abstract*
Paul Graja - Fraunhofer IKTS
Norbert Meyendorf - Fraunhofer IKTS

In-Situ Laser Ultrasound Measurements of Austenitic Grain Growth in Plain Carbon Steel, {QNDE2021-75223} *Abstract*
Christian Kerschbaummayr - RECENDT GmbH
Martin Ryzy - RECENDT GmbH
Mike Hettich - RECENDT GmbH
Bernhard Reitinger - RECENDT GmbH
Jan Dzugan - COMTES FHT
Thomas Wydra - Linseis Meßgeräte GmbH
Edgar Scherleitner - RECENDT GmbH

11-03: NDE/SHM for Oil & Gas Industry

7/29/2021
2:05 PM to 2:55 PM

Chair: ***Yang Liu - University of Wyoming***
Presentations:

Combined Inductive and Capacitive Nde Technique for Composite-Metal Hybrid Structures, {QNDE2021-75049} *Abstract*
Xiaokang Yin - China University of Petroleum (east China)

High Resolution Multi-Complex Defect Imaging Using Full Waveform Inversion Technique, {QNDE2021-75023} *Abstract*

Junkai Tong - Tianjin University
Yang Liu - Tianjin University
Jiahao Ren - Tianjin University
Min Lin - University of Wyoming
Jian Li - Tianjin University

Lamb Second Harmonic Tomography for Detection and Evaluation of Fatigue Cracks in Metal Plates, {QNDE2021-75051} *Abstract*

Chengwei Zhao - Tianjin University
Sunia Tanweer - School of Mechanical and Manufacturing Engineering (SMME)
Xiang Zhang - University of Wyoming
Yang Liu - Tianjin University

Research on Key Technologies of Precise Measurement of Geographical Coordinates for Subsea Pipelines, {QNDE2021-74931} *Abstract*

Jian Li - Tianjin University
Jialin Wang - Tianjin University
Xinjing Huang - Tianjin University
Mingze Li - Tianjin University

14-03: NDE for Nuclear Power

7/29/2021
2:05 PM to 2:55 PM

Chair: ***Bill Glass - PNNL***
Chair: ***Thiago Seauciuc-Osorio - Electric Power Research Institute***

Presentations:

Detection of Early Stage Fatigue in Martensitic Steels – Introduction & Project Overview

Maria Guimaraes - EPRI
Thiago Seauciuc-Osorio - EPRI
Joe Wall - EPRI

Microstructure Characterization in Martensitic Steels Using Thermoelectric Nde, {QNDE2021-74544} *Technical Presentation Only*

Peter B. Nagy - Univ Of Cincinnati
Ethan Robinson - University of Cincinnati

Magnetic Methods for the Identification of Incorrect Microstructures in Grade 91 Power Station Steels, {QNDE2021-74928} *Technical Presentation Only*

John Wilson - University of Manchester
Anthony Peyton - University of Manchester

Ultrasonic Characterization of Grade 91 and 92 Steel With Different Heat Treatments, {QNDE2021-75091} *Abstract*

Guillermo Huanes-Alvan - Michigan State University
Thiago Seuaciuc-Osorio - Electric Power Research Institute
Sunil Kishore Chakrapani - Michigan State University

Nondestructive Microstructure Characterization of Temperate Martensitic Steels – Fusion of Nde Techniques, {QNDE2021-74569} *Abstract*

Thiago Seuaciuc-Osorio - Electric Power Research Institute
Joe Wall - Electric Power Research Institute
Maria Guimaraes - Electric Power Research Institute

Fatigue Detection and Estimation in Martensitic Stainless-Steel Using Magnetic Nondestructive Evaluation Techniques, {QNDE2021-74657} *Abstract*

Bharath Basti Shenoy - Michigan State University
Zi Li - Michigan State University
Lalita Udpa - Michigan State University
Satish Udpa - Michigan State University
Yiming Deng - Michigan State University
Thiago Seuaciuc-Osorio - Electric Power Research Institute (EPRI)

04-01: Eddy Current NDE

7/29/2021
2:05 PM to 2:55 PM

Chair: ***Matthew Cherry - Air Force (AFRL/RXCA)***

Presentations:

Probability of Detection for High-Frequency Eddy Current Testing of Carbon Fiber Reinforced Plastics, {QNDE2021-74698} *Abstract*

Sebastian Joas - University of Stuttgart, Institut für Kunststofftechnik
Marc Kreutzbruck - University of Stuttgart, Institut für Kunststofftechnik

Improved Eddy Current Testing Sensitivity Using Phase Information, {QNDE2021-74801} *Abstract*

Amanda To - Warwick University
Zhichao Li - Warwick University
Steve Dixon - Warwick University

Investigation of the Modelling of Fibre Waviness Using High-Frequency Tx-Rx Eddy Current Technique, {QNDE2021-74894} *Abstract*

Qiuji Yi - Bristol University
Robert Huges - Bristol University

Paul Wilcox - Bristol University

Ole Thomsen - Bristol University

Reduced False Calls in Eddy Current Images Using Signal Processing, {QNDE2021-75186} *Abstract*

Manoj KumarKM - GE Research
Aparna Sheila-Vadde - GE Research
Mahalakshmi Sb - GE Research
Ganesh Seshadri - GE Research

Model-Based Inversion Approach for Crack Sizing Addressing Model Discrepancy and Variability in Bolt-Holt Eddy Current Inspections, {QNDE2021-75244} *Abstract*

John Aldrin - Computational Tools
John Nagel - TRI Austin, Inc.
Mark Keiser - TRI Austin, Inc.
Sarah Williams - TRI Austin, Inc.
David Forsyth - TRI Austin, Inc.
Harold Sabbagh - Victor Technologies
Elias Sabbagh - Victor Technologies
George Nuxoll - UniWest
Eric Lindgren - Air Force Research Laboratory
Matthew Cherry - Air Force Research Laboratory

FRIDAY, JULY 30, 2021

08-02: NDE for Additive Manufacturing

7/30/2021
9:45 AM to 10:30 AM

Chair: ***Austin Downey - University of South Carolina***
Chair: ***Peter Juarez - NASA***

Presentations:

Porosity Inspection in Metal Directed Energy Deposition Using Femtosecond Laser Based Transient Thermoreflectance Measurement, {QNDE2021-68491} *Abstract*

Peipei Liu - Korea Advanced Institute of Science and Technology (KAIST)
Kiyoon Yi - Korea Advanced Institute of Science and Technology (KAIST)
Hoon Sohn - Korea Advanced Institute of Science and Technology (KAIST)

Linear and Nonlinear Analysis of Additively Manufactured Material With Different Porosity Induced by Varying Material Printing Speed Using Guided Acoustic Waves, {QNDE2021-74686} *Abstract*

Sehyuk Park - University of Arizona

Hamad Alnuaimi - The University of Arizona

Anna Hayes - The University of Arizona
Madison Sitkiewicz - The University of Arizona
Umar Amjad - The University of Arizona
Krishna Muralidharan - The University of Arizona
Tribikram Kundu - The University of Arizona

Evaluation of Defect Detection Algorithm Through Realistic X-Ray Computed Tomography Simulation of Additive Manufacturing Defects, {QNDE2021-74956}
Abstract

Felix H. Kim - National Institute of Standards and Technology
John Henry J. Scott - National Institute of Standards and Technology
Edward J. Garboczi - National Institute of Standards and Technology

The Role of 3d X-Ray Computed Tomography in Additive Manufacturing, {QNDE2021-75087} *Technical Presentation Only*

Herminso Villarraga-Gomez - ZEISS Industrial Quality Solutions

Estimation of Internal Surface Roughness of Additively Manufactured Components Under Complex Conditions Using Artificial Intelligence and Measurements of Ultrasonic Backscatter, {QNDE2021-75106} *Abstract*

Mohamed Subair Syed Akbar Ali - Indian Institute of Technology Madras, India
*Mato Pavlovic - A*STAR (Agency for Science, Technology and Research)*
Prabhu Rajagopal - Indian Institute of Technology Madras, India

---

06-04: Guided Waves

7/30/2021
9:45 AM to 10:30 AM

Chair: ***Paul Fromme - UCL***
Chair: ***Michael Lowe - Imperial College London***

Presentations:

Detection of Defects in Ti Using Shear Horizontal Guided Waves, {QNDE2021-74942}
Abstract

Christian Peyton - University of Warwick
Rachel Edwards - University of Warwick
Steve Dixon - University of Warwick
Ben Dutton - The Manufacturing Technology Centre
Wilson Vesga - The Manufacturing Technology Centre

Beam Forming of Sh Guided Waves Using Double-Row Staggered Halbach Emat, {QNDE2021-75103} *Abstract*

Siddharth Shankar - Indian Institute of Technology Madras

Guided Wave Mode Excitation on Inclined Surface by Meander Line Coil Emat, {QNDE2021-74878} *Abstract*

Farrukhbek Karimov - Mechanical Engineering, Keio University
Hirokazu Enomoto - Mechanical Engineering, Keio University
Shohei Yamakawa - Mechanical Engineering, Keio University
Toshihiko Sugiura - Mechanical Engineering, Keio University

Guided waves mode filtering using fiber Bragg grating sensors, {QNDE2021-75100} *Abstract*

Rohan Soman - Institute of Fluid Flow Machinery, PaSci
Wieslaw Ostachowicz - Institute of Fluid Flow Machinery, PaSci

Online Monitoring of Electric Power Box Using Waveguide Sensors, {QNDE2021-75069} *Abstract*

Jaykumar Fultariya - Indian Institute of Technology Madras
Nishanth Raja - Indian Institute of Technology Madras
Krishnan Balasubramaniam - Indian Institute of Technology Madras

---

15-01: Resonant NDE

7/30/2021
9:45 AM to 10:30 AM

Chair: ***Sunil Kishore Chakrapani - Michigan State University***
Chair: ***Len Gelman - The University of Huddersfield***
Chair: ***Matthew Cherry - AFRL***

Presentations:

Bayesian Inference of Elastic Constants and Texture Coefficients in Additively Manufactured Alloys Using Resonant Ultrasound Spectroscopy, {QNDE2021-74511} *Abstract*

Jeff Rossin - University of California Santa Barbara
Patrick Leser - NASA Langley Research Center
Kira Pusch - University of California Santa Barbara
Carolina Frey - University of California Santa Barbara
Sean Murray - University of California Santa Barbara
Chris Torbet - University of California Santa Barbara
Stephen Smith - NASA Langley Research Center
Samantha Daly - University of California Santa Barbara
Tresa Pollock - University of California Santa Barbara

Process Monitoring and Estimation of Material Properties of Additively Manufactured Components Using Model-Based Inversion of Process Compensated Resonance Testing (Pcrt) Data, {QNDE2021-75772} *Abstract*

Julieanne Heffernan - Vibrant Corporation

Alexander Mayes - Vibrant
Niklas Höhn - Vibrant GmbH
Martin Bach - Airbus Helicopters Deutschland GmbH
Ira Widmayer - Airbus Helicopters Deutschland GmbH
Eric Biedermann - Vibrant
Leanne Jauriqui - Vibrant

Elastic Properties of In718 Fabricated via Laser Directed Energy Deposition (Ded), {QNDE2021-74848} *Abstract*
Mohammed Mizanur Rahman - Michigan State University
Guillermo Huanes-Alvan - Michigan State University
Himanshu Sahasrabudhe - Michigan State University
Sunil Kishore Chakrapani - Michigan State University

Local Defect Resonance of a Crack, {QNDE2021-74932} *Abstract*
Igor Solodov - Institute for Plastics Technology, University of Stuttgart
Johannes Rittmann - Institute for Plastics Technology, University of Stuttgart
Marc Kreutzbruck - Institute for Plastics Technology, University of Stuttgart

Vibration Analysis for Nde of Ceramic Components, {QNDE2021-75218} *Abstract*
Bernd Koehler - Fraunhofer IKTS
Kilian Tschöke - Fraunhofer IKTS
Mareike Stephan - Fraunhofer IKTS
Sergey Gartsev - Fraunhofer IKTS
Martin Barth - Fraunhofer IKTS

11-04: NDE/SHM in Oil & Gas Industry

7/30/2021
9:45 AM to 10:30 AM

Chair: ***Yang Liu - University of Wyoming***
Presentations:

Probabilistic Integration of Structural Health Monitoring Data Into a Digital Twin for Structural Integrity Prognosis, {QNDE2021-74687} *Abstract*
Michael Siu Hey Leung - Imperial College London
Joseph Corcoran - University of Cincinnati

Finite Element Simulation and Experiment Study on Exciting Circumferential Quasi-Sh Waves in a Casing, {QNDE2021-75057} *Abstract*
Xuelian Chen - China University of petroleum
Yan Zhuang - China University of petroleum
Xiaokang Yin - China University of petroleum
Xiaoming Tang - China University of petroleum

A Location Method for Subsea Pipeline Based on Active Magnetization, {QNDE2021-74982} *Abstract*

Huang Xinjing - Tianjin university
Wang Yuan - Tianjin University
Wu Jialin - Tianjin University
Li Jian - Tianjin University
Feng Hao - Tianjin University
Zhang Yu - Tianjin University

Analysis and Separation of Emat Testing Signal for Ferromagnetic Materials, {QNDE2021-75385} *Abstract*

Zenghua Liu - Beijing University of Technology
Xin Zhao - Beijing University of Technology
Zhilin Huo - Beijing University of Technology
Zhengyu Chen - Beijing University of Technology
Cunfu He - Beijing University of Technology
Bin Wu - Beijing University of Technology

Aboveground Storage Tanks Leak Detection Through Acoustic Emission Sensor Nodes, {QNDE2021-75182} *Abstract*

Denis Bogomolov - The University of Bologna
Nicola Testoni - The University of Bologna
Luca De Marchi - The University of Bologna
Tommaso Borzone - Eni SpA
Antonio Terribile - Eni SpA
Giuseppe Giunta - Eni S.p.A ,Technology, R&D & Digital
Alessandro Marzani - The University of Bologna

05-02: Electromagnetic NDE Techniques

7/30/2021
9:45 AM to 10:30 AM

Chair: ***Saptarshi Mukherjee - Lawrence Livermore National Laboratory***
Chair: **Yiming Deng – *Michigan State University***

Presentations:

Feasibility of Using Spread Spectrum Time Domain Reflectometry to Monitor Battery Cell Degradation, {QNDE2021-74323} *Abstract*

Alex Charters - University of Utah
Paul Kuhn - University of Utah
Hunter Ellis - University of Utah
Dawn Sweeney - University of Utah
Marc Fobair - Solar Winds
Joel Harley - University of Florida
Cynthia Furse - University of Utah

An Electromagnetic Nondestructive Device for Ultra-High Performance Concrete (Uhpc), {QNDE2021-74968} *Technical Presentation Only*

Daniel Alabi - University of Florida
Megan Voss - University of Florida
Raid Alrashidi - University of Florida
Christopher Ferraro - University of Florida
Kyle Riding - University of Florida
Joel Harley - University of Florida

Evaluating Temper Embrittlement in Hy-80 Steel Using Magnetic Barkhausen Noise and Microstructural Characterization, {QNDE2021-75000} *Abstract*

Michael Roberts - University of Florida
Jason Schibler - University of Florida
Charles D' Ambra - University of Florida
Aroba Saleem - University of Florida
Michele Manuel - University of Florida
Thomas Krause - Royal Military College of Canada

Assessment of Damage in Metallic Plates by Ultra-Wideband Guided Electromagnetic Waves, {QNDE2021-75123} *Abstract*

Vittorio Memmolo - University of Naples FEDERICO II
Jochen Moll - Goethe University Frankfurt am Main
Duy Hai Nguyen - Goethe University of Frankfurt am Main
Viktor Krozer - Goethe University of Frankfurt am Main
Jakob Holstein - Goethe University of Frankfurt am Main
Rohit Kapoor - Goethe University of Frankfurt am Main
Jonathan Stindl - Goethe University of Frankfurt am Main

16-02: Structural Health Monitoring

7/30/2021
10:45 AM to 11:30 AM
Chair: ***Austin Downey - University of South Carolina***
Chair: ***Olivier Mesnil - CEA***

Presentations:

Federal Aviation Administration's Probability of Detection Testing Results for Structural Health Monitoring, {QNDE2021-75122} *Abstract*

Paul Swindell - Diakon Solutions
Danielle Stephens - Federal Aviation Administration
Kelsey Warfle - Diakon Solutions

Application of Ultrasonic Guided Waves for Shm of Composite Honeycomb Constructions, {QNDE2021-75213} *Abstract*

Renaldas Raisutis - Ultrasound Research Institute, Kaunas University of Technology

Egidijus Zukauskas - Ultrasound Research Institute, Kaunas University of Technology
Vykintas Samaitis - Ultrasound Research Institute, Kaunas University of Technology
Audrius Jankauskas - Ultrasound Research Institute, Kaunas University of Technology
Lina Draudviliene - Ultrasound Research Institute
Paulius Griskevicius - Department of Mechanical Engineering, Kaunas University of Technology
Kazimieras Juzenas - Department of Manufacturing Engineering, Kaunas University of Technology

Structural Health Monitoring of Electro-Mechanical Actuators in Aviation: Recent Breakthroughs and Further Challenges, {QNDE2021-75230} *Abstract*

Vittorio Memmolo - University of Naples FEDERICO II
Carmine Vaselli - University of Naples "Federico II"
Ernesto Monaco - University of Naples "Federico II"
Nicola Cimminiello - Italsystem Srl
Pasquale Salvato - Italsystem Srl
Fabrizio Ricci - University of Naples "Federico II"

State-Based Impact Damage Quantification Using Large Area Capacitive Sensors, {QNDE2021-75250} *Abstract*

Alexander Vereen - University of South Carolina
Austin Downey - University of South Carolina
Subramani Sockalingam - University of South Carolina
Simon Laflamme - Iowa State University

Coda Waves for the Health Monitoring of Composites Under Low-Velocity Impact, {QNDE2021-75297} *Abstract*

Subal Sharma - Iowa State University
Vinay Dayal - Iowa State University

Characterizing Impact-Type Defect in Pultruded Gfrp Composite Plate Using Non-Contact Air-Coupled Ultrasonic Techniques, {QNDE2021-74990} *Abstract*

Aadhik Asokkumar - Kaunas University of Technology
Elena Jasiūnienė - Kaunas University of Technology
Renaldas Raišutis - Kaunas University of Technology
Rymantas Kažys - Kaunas University of Technology

06-05: Guided Waves

7/30/2021
10:45 AM to 11:30 AM

Chair: ***Paul Fromme - UCL***
Chair: ***Michael Lowe - Imperial College London***
Presentations:

Identification of Defect Growth in Guided Wave Measurements, {QNDE2021-75026}
Abstract

Isaac Setshedi - University of Pretoria
Daniel Wilke - University of Pretoria
Philip Loveday - University of the Witwatersrand
Craig Long - Council for Scientific and Industrial Research

In Situ Measurement of Poisson's Ratio of Steel Plates During Thermal Processes Using Resonant Modes, {QNDE2021-74926} *Abstract*

Clemens Grünsteidl - Research Center for Non-Destructive Testing GmbH
Christian Kerschbaummayr - Research Center for Non-Destructive Testing GmbH
Edgar Scherleitner - Research Center for Non-Destructive Testing GmbH
Thomas Mitter - VOESTALPINE Stahl GmbH
Gerhard Angeli - VOESTALPINE Stahl GmbH

Onload Guided Wave Inspection of Boiler Spine of Nuclear Power Stations, {QNDE2021-74393} *Abstract*

John Jian - EDF Energy

Determination of the Acoustic Attenuation in the Ghz-Regime Using Zero-Group Velocity Plate-Resonances, {QNDE2021-74919} *Abstract*

Martin Ryzy - Research Center for Non Destructive Testing
Clemens Grünsteidl - Research Center for Non Destructive Testing
Michael Salfinger - Research Center for Non Destructive Testing
István Veres - Qorvo
Thomas Berer - Qorvo

11-05: NDE/SHM for Oil & Gas Industry

7/30/2021
10:45 AM to 11:30 AM

Chair: ***Yang Liu - University of Wyoming***

Presentations:

Light Weight Emat System for Robotic Inspections in the Field, {QNDE2021-75120}
Abstract

Frederic Cegla - Imperial College London
Pouyan Khalili - Sonobotics Ltd
Arnau Garriga Casanovas - Imperial College London

Acoustic Magnifying Lens Based on Compact Non-Dispersive Spiral Metamaterial Array, {QNDE2021-75073} *Abstract*

Li Xiang - State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University, Tianjin 300072, China

Li Jian - State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University, Tianjin 300072, China
Huang Xinjing - State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University, Tianjin 300072, China

Contact-Free Ultrasonic Metal Sheet Thickness Estimation Using an Air-Coupled Optical Microphone, {QNDE2021-74885} *Abstract*
Georg Kaniak - XARION Laser Acoustics GmbH
Ryan Sommerhuber - XARION Laser Acoustics GmbH
Wolfgang Rohringer - XARION Laser Acoustics GmbH
Balthasar Fischer - XARION Laser Acoustics GmbH

Acoustic Fields of Logging While Drilling in Heterogeneous Formations: Numerical Simulations, {QNDE2021-75686} *Technical Presentation Only*
Yue Pan - Institute of Acoustics, Chinese Academy of Sciences
Xiao He - Institute of Acoustics, Chinese Academy of Sciences
Xiuming Wang - Institute of Acoustics, Chinese Academy of Sciences

Leak Detection and Leakage Assessment of Submarine Pipelines Based on Passive Acoustics, {QNDE2021-74993} *Abstract*
Zhu Feng - Tianjin University
Yu Zhang - Tianjin University
Xiaobo Rui - Tianjin University

07-04: Machine Learning and Statistical Methods in NDE

7/30/2021
10:45 AM to 11:30 AM

Chair: ***Joel Harley - University of Florida***
Chair: ***Daniel Sparkman - Air Force Research Laboratory***

Presentations:

Application of Self-Learning Algorithms for Defect Categorization in Active Thermography, {QNDE2021-74937} *Abstract*
Johannes Rittmann - Institut für Kunststofftechnik, University of Stuttgart
Marc Kreutzbruck - Institut für Kunststofftechnik, University of Stuttgart

Ultrasound Computed Tomography Acceleration Using Deep Convolutional Neural Networks, {QNDE2021-75889} *Technical Presentation Only*
Robert Donaldson - University of Alabama
Jiaze He - University of Alabama

Machine Learning for Spread Spectrum Time-Domain Reflectometry Impedance Measurement, {QNDE2021-75252} *Abstract*
Farhad Elyasichamazkoti - University of Utah

Evan Benoit - University of Utah
Dawn Sweeney - University of Utah
Cynthia Furse - University of Utah

Estimating Guided Wave Velocity Variation With Neural Networks, {QNDE2021-75080}
Abstract
Ori Leibovici - University of Florida
Kang Yang - University of Florida
Joel B. Harley - University of Florida

13-02 / 17-01: Nonlinear Ultrasonic Techniques (part 2) and Thermal Techniques for NDE

7/30/2021
10:45 AM to 11:30 AM

Chair: ***Stephen D Holland - Iowa State University***
Chair: ***Xiaoyan Han - Wayne State University***

Presentations:

One Dimensional Nonlinear Wave Propagation in a Rate Independent Pinched Hysteretic Material, {QNDE2021-74515} *Abstract*
Pravinkumar Ghodake - Indian Institute of Technology Bombay

Detecting and Monitoring Impact Damage in Composite Plates Using Nonlinear Spc-Index Ultrasonic Technique, {QNDE2021-74611} *Abstract*
Hamad Alnuaimi - University of Arizona
Umar Amjad - The University of Arizona
Sehyuk Park - The University of Arizona
Pietro Russo - Institute for Polymers, Composites and Biomaterials, National Research Council
Valentina Lopresto - Department of Chemical, Materials and Production Engineering, University of Naples
Kundu Tribikram - The University of Arizona

Crack Heating Model for Vibrothermography Based on Angled Friction, {QNDE2021-74028} *Technical Presentation Only*
Stephen D Holland - Iowa State University
Ashraf Bastawros - Iowa State University
Henry Moldenhauer - Iowa State University
Chevonne Mcinnis - Iowa State University

Ultrasonic Welder Modeling for Vibrothermography, {QNDE2021-74029}
Technical Presentation Only
Stephen D Holland - Iowa State University

Jared Taylor - Iowa State University
Nathan Scheirer - Iowa State University

Humidity Detection in Multi-Layer Components by Partial Least-Squares Thermography, {QNDE2021-75219} *Abstract*

Marcos Souza - Université Laval
Xavier Maldague - Université Laval

Thank you to all authors, session chairs and organizers for your hard work and efforts. We look forward to seeing you in 2022.

ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems (JNDE)

Purpose

The *Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems* (JNDE) is an international archival journal that will cover the many aspects of interdisciplinary work in the field of NDE and SHM and report use of NDE and SHM in a wide range of applications in industry, government sector, and academia. The goal of the journal is to inform readers with state-of-the art developments in NDE, SHM and prognosis, disseminate new ideas on these subjects, and report related valuable applications. It is envisioned that the journal will bring under one umbrella engineering and science disciplines contributing to NDE, SHM and prognosis and feature practical applications of NDE and SHM in many technical fields.

Learn more at: https://asmedigitalcollection.asme.org/nondestructive/pages/about.

THANK YOU TO ALL THE TRACK CHAIRS, SESSION ORGANIZERS, PRESENTERS & ASME STAFF MEMBERS FOR YOUR PARTICIPATION AND HARD WORK.

WE LOOK FORWARD TO SEEING YOU IN 2022!

THANK YOU TO OUR BRONZE SPONSOR