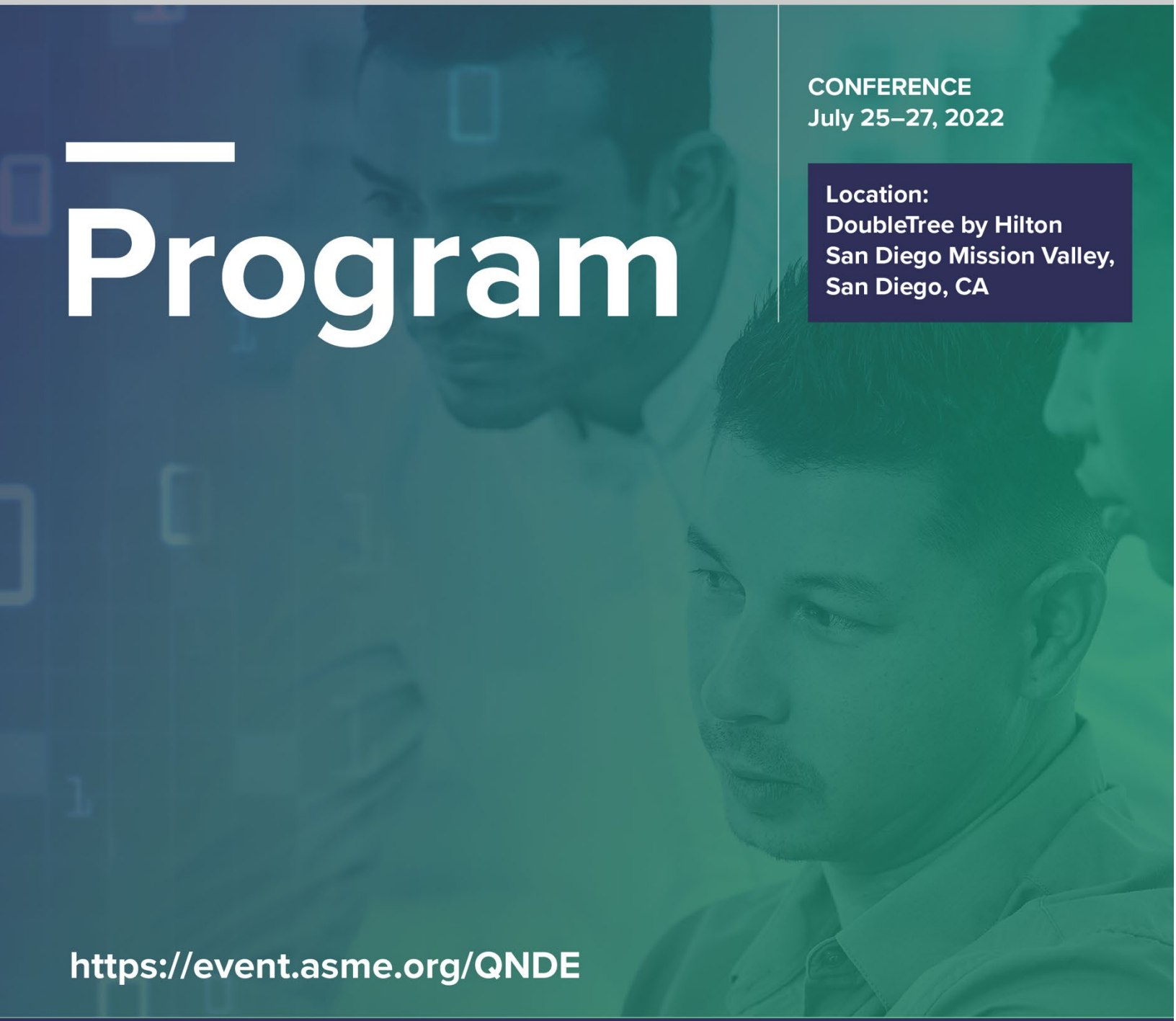
ASME 2022 QNDE

49th Annual Review of Progress in Quantitative Nondestructive Evaluation

Program

CONFERENCE
July 25–27, 2022

Location:
DoubleTree by Hilton
San Diego Mission Valley,
San Diego, CA



https://event.asme.org/QNDE

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SETTING THE STANDARD

QNDE 2022

Welcome to QNDE 2022

Dear Colleagues:

As the QNDE 2022 Conference Chair and Co-Chairs it is our privilege and honor to welcome you to the 49th Annual Review of Progress in Quantitative Non-Destructive Evaluation conference. In its 49 years of history this conference has never been cancelled although in last two years, 2020 and 2021, we had to convert it to virtual setting due to pandemic. After two years of virtual conference by popular demand we are now back to in-person conference. Changing the conference mode from in-person to virtual setting in 2020 and then from virtual mode back to in-person conference in 2022 was possible because of the hard work and support from the organizing committee, ASME staff, authors, moderators, panelists and plenary speakers.

QNDE is blessed with having a good number of loyal attendees who come to this conference every year. As a result, even during the pandemic years we had over 200 attendees joining the conference.

We believe you will enjoy the conference. We also understand that no matter how well we prepare for it, after two years of virtual conference 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 2023 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 participate in the conference activities as much as possible, 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 in sunny San Diego!

Sincerely,

Tribikram (Bikram) Kundu, University of Arizona, Conference Chair

Henrique Reis, University of Illinois at Urbana-Champaign, Conference Co-Chair

Jeong-Beom Ihn, The Boeing Company, Conference Co-Chair

QNDE 2022

THANK YOU TO THE 2022 TRACK ORGANIZERS

Advanced Modelling for NDE & Ultrasonic Scattering

- Andrea Arguelles, *Penn State University*

Design and Application of Metamaterials for Quantitative NDE/SHM and Energy Harvesting

- Sourav Banerjee, *University of South Carolina*
- Saman Farhangdoust, *Stanford University*

Digital Thread/Digital Twin/NDE Big Data

- Steve Holland, *Iowa State University*

Electromagnetic NDE Techniques

- John Wertz, *Air Force Research Laboratory*
- 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*

NDE for Additive Manufacturing

- Hoon Sohn, *KAIST (Korean Advanced Institute of Science & Technology)*
- Peipei Liu, *KAIST (Korean Advanced Institute of Science & Technology)*

NDE for Civil Infrastructure

- Sanchit Gupta, *University of California San Diego*
- Anna Castellano, *Polytechnic University of Bari*
- Aguinaldo Fraddosio, *Polytechnic University of Bari*

NDE Modeling and Prognostics for Composites

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

NDE/SHM for Oil & Gas Industry

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

Nondestructive assessment of structural integrity for lightweight structures

- Wieslaw Ostachowicz, *Polish Academy of Sciences, IFFM*
- Roger M. Groves, *TU Delft, Netherlands*

Nonlinear Ultrasonic Techniques

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

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

- Wieslaw Ostachowicz, Polish Academy of Sciences
- 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*

Material Characterization by Ultrasonic waves

- Paul Dryburgh, *University of Nottingham*
- Yevgeniya Lugovtsova, *Federal Institute for Materials Testing and Research (BAM)*
- Vittorio Memmolo, *University of Naples "Federico II"*

Online NDE techniques for Smart Manufacturing

- Henrique Reis, *University of Illinois at Urbana-Champaign*
- Yanfeng Shen, *Shanghai Jiao Tong University*

POSTER ONLY

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

2022 Session Organizers

Advanced Modelling for NDE
Session Chairs: Andrea Arguelles, Wiesław Ostachowicz

Metamaterials and Thermal Techniques for NDE
Session Chairs: Jeong-Beom (JB) Ihn, Yuris Dzenis

Digital Thread/Digital Twin/Big Data
Session Chairs: Stephen D Holland

Electromagnetic NDE Techniques
Session Chair: John Wertz

Guided Waves I
Session Chairs: Paul Fromme, Michael Lowe

Machine Learning and Statistical Methods in NDE
Session Chairs: Joel B. Harley, Laura Homa

NDE for Additive Manufacturing
Session Chairs: Hoon Sohn, Peipei Liu

NDE for Civil Infrastructure
Session Chairs: Sanchit Gupta, Tribikram Kundu

NDE Modeling and Prognostics for Composites
Session Chairs: Elizabeth Gregory, Portia Banerjee

NDE/SHM for Oil & Gas Industry
Session Chair: Xin Chen

Nonlinear Ultrasonics
Session Chairs: Christopher Kube, Laurence Jacobs

Nuclear Power NDE
Session Chair: Samuel Glass

Structural Health Monitoring
Session Chairs: Wiesław Ostachowicz, Tribikram Kundu

Ultrasonic Arrays
Session Chairs: Paul Wilcox, Sergio Cantero-Chinchilla

Material Characterization by Ultrasonic waves
Session Chairs: Paul Dryburgh, Yevgeniya Lugovtsova

Online NDE techniques for smart manufacturing
Session Chair: Henrique Reis

Poster Session
Session Chair: Henrique Reis

CONFERENCE INFORMATION

Registration Information

South Foyer, Lobby Level

Registration Hours:

Sunday, July 24, 3:00 PM – 5:30 PM

Monday, July 25, 7:00 AM – 5:30 PM

Tuesday, July 26, 7:00 AM – 5:00 PM

Wednesday, July 27, 7:30 AM – 12:00 PM

Exhibit Information

South Foyer, Lobby Level

Visit our exhibitors during the conference hours on Monday, July 25 – Wednesday, July 27.

Audio Equipment in Session Rooms

All technical sessions are equipped with one LCD projector, screen and laptop. Please bring your presentation on a thumb drive 15 minutes prior to the session start time. A speaker ready room is available on Monday and Tuesday from 7:00 AM – 5:00 PM and Wednesday until 12:00 PM in Loft I.

Badge Required for Admission

All conference attendees must have an official ASME 2022 QNDE badge at all times in order to gain admission to technical sessions, exhibits, and other conference events. Without a badge, you will not be granted admission to conference activities.

ASME Complimentary Membership

Any attendee that pays a non-member conference registration fee will receive a four-month ASME membership free of charge. ASME will activate this complimentary membership for qualified attendees approximately four weeks after the conclusion of the conference.

Conference App

Download the ASME Pheedloop App and hold the entire program in the palm of your hand! The ASME Pheedloop App allows you to easily look up sessions, search for abstracts or people, message with other attendees, and create your own schedule. Be sure to download the app for the latest information.

Wi-Fi

Enjoy complimentary wi-fi in the meeting space using the credentials below.

*Connect to DoubleTree Meetings

*Access code ASME2022

Conference Papers Electronic Access

All full conference registrants will receive online access to papers and presentations made at the 2022 QNDE Conference. Access will be granted using your registration email address. Papers that were not presented on-site in San Diego or did not receive pre-approval to be presented via video, will not be published in the conference proceedings and cannot be cited or indexed.

Exhibit Hours

Visit our sponsors and exhibitors during the conference hours in the South Foyer of the DoubleTree by Hilton San Diego Mission Valley.

Conference Lunches

Lunch with Students & Early Career Professionals will be served in the Gallery Room on **Monday, July 25 from 12:20 PM – 1:20 PM.**

The *Awards Luncheon* will be on **Tuesday, July 26th from 12:20 PM – 1:20 PM** in the Gallery Room and celebrate a select group for their contributions and achievements in quantitative nondestructive evaluation.

Refreshment Breaks

Morning and afternoon breaks will be provided in the South Foyer, Lobby Level. Come and meet our sponsors and exhibitors and join your fellow attendees for a few minutes of networking and discussion. The schedule is as follows:

Monday – Tuesday, July 25-26
9:50 AM – 10:20 AM and 3:00 PM – 3:30 PM

Wednesday, July 27
9:50 AM – 10:20 AM

Poster Presentations

Join your fellow authors presenting their poster submission on Tuesday, July 26 during the refreshment breaks in the South Foyer.

Opening Reception

Monday, July 25
6:00 PM - 7:30 PM
Gallery Room

QNDE 2022 SCHEDULE-AT-A GLANCE *		
Time Available	**Event**	**Room**
SUNDAY, JULY 24, 2022		
3:00 PM-5:30 PM	Registration	South Foyer
MONDAY, JULY 25, 2022		
7:00AM-5:30PM	Registration	South Foyer
7:00AM-5:00PM	Speaker Ready Room	Loft I
8:30 AM-9:50 AM	Plenary Session "Nondestructive Assessment of Structural Integrity for Lightweight Structures", Wieslaw Ostachowicz, Ph.D	Great Room I, II, III, IV
9:50 AM-10:20 AM	AM Coffee Break	South Foyer
10:20 AM-12:00 PM	06-01 - Machine Learning and Statistical Methods in NDE	Shutters East I
10:20 AM-12:00 PM	07-01 - NDE for Additive Manufacturing	Shutters East II
10:20 AM-12:00 PM	19-01 - Material Characterization by Ultrasonic waves	Shutters West I
10:20 AM-12:00 PM	09-01 - NDE Modeling and Prognostics for Composites	Shutters West II
10:20 AM-12:00 PM	17-01 - Ultrasonic Arrays	Brickstones
12:20 PM-1:20 PM	Lunch With Students & Early Career Professionals	Gallery
1:20 PM-3:00 PM	06-02 - Machine Learning and Statistical Methods in NDE	Shutters East I
1:20 PM-3:00 PM	07-02 - NDE for Additive Manufacturing	Shutters East II
1:20 PM-3:00 PM	19-03 - Material Characterization by Ultrasonic waves	Shutters West I
1:20 PM-3:00 PM	05-01 - Guided Waves	Shutters West II
1:20 PM-3:00 PM	17-02 - Ultrasonic Arrays	Brickstones
3:00 PM-3:30 PM	PM Coffee Break	South Foyer
3:30 PM-5:30 PM	06-03 - Machine Learning and Statistical Methods in NDE	Shutters East I
3:30 PM-5:30 PM	15-01 - Structural Health Monitoring	Shutters East II
3:30 PM-5:30 PM	19-02- Material Characterization by Ultrasonic waves	Shutters West I
3:30 PM-5:30 PM	05-02 - Guided Waves	Shutters West II
3:30 PM-5:30 PM	20-01 - Online NDE techniques for smart manufacturing	Brickstones
6:00 PM - 7:30 PM	Opening Reception	Gallery
TUESDAY, JULY 26, 2022		
7:00 AM-5:00 PM	Registration	South Foyer
7:00 AM-5:00 PM	Speaker Ready Room	Loft I
8:30 AM-9:50 AM	Plenary Session "Applications of Data Science and Machine Learning to Ultrasonic Multi-view Imaging", Paul Wilcox, Ph.D.	Great Room I, II, III, IV
9:50 AM-10:20 AM	AM Coffee Break	South Foyer
10:20 AM-12:00 PM	06-04 - Machine Learning and Statistical Methods in NDE	Shutters East I
10:20 AM-12:00 PM	04-01 - Electromagnetic NDE Techniques	Shutters East II

10:20 AM-12:00 PM	12-01 - Nonlinear Ultrasonic Techniques	Shutters West I
10:20 AM-12:00 PM	05-03 - Guided Waves	Shutters West II
10:20 AM-12:00 PM	17-03 - Ultrasonic Arrays	Brickstones
12:00 PM-1:20 PM	Awards Luncheon	Gallery
1:20 PM-3:00 PM	10-01 - NDE/SHM for Oil & Gas Industry	Shutters East I
1:20 PM-3:00 PM	13-01 - Nuclear Power NDE	Shutters East II
1:20 PM-3:00 PM	12-02 - Nonlinear Ultrasonic Techniques	Shutters West I
1:20 PM-3:00 PM	05-04 - Guided Waves	Shutters West II
1:20 PM-3:00 PM	08-01 - NDE for Civil Infrastructure	Brickstones
3:00 PM-3:30 PM	PM Coffee Break	South Foyer
3:30 PM-5:30 PM	10-02 - NDE/SHM for Oil & Gas Industry	Shutters East I
3:30 PM-5:30 PM	15-02 - Structural Health Monitoring	Shutters East II
3:30 PM-5:30 PM	12-03 - Nonlinear Ultrasonic Techniques	Shutters West I
3:30 PM-5:30 PM	05-05 - Guided Waves	Shutters West II
3:30 PM-5:30 PM	01-01 - Advanced Modelling for NDE & Ultrasonic Scattering	Brickstones
5:30 PM-6:30 PM	NDE Division Committee Meeting	Gallery
WEDNESDAY, JULY 27, 2022		
7:30 AM-12:00 PM	Registration	South Foyer
07:00AM-12:00PM	Speaker Ready Room	Loft I
8:30 AM-9:50 AM	Plenary Session “Ultrasonic Transducers for Harsh Environments”, Bernherd Tittmann, Ph.D.	Great Room I, II, III, IV
9:50 AM-10:20 AM	AM Coffee Break	South Foyer
10:20 AM-12:00 PM	10-03 - NDE/SHM for Oil & Gas Industry	Shutters East I
10:20 AM-12:00 PM	13-02 - Nuclear Power NDE	Shutters East II
10:20 AM-12:00 PM	03-01 - Digital Thread/Digital Twin/NDE Big Data	Shutters West I
10:20 AM-12:00 PM	02-01 - Metamaterials and Thermal Techniques for NDE	Shutters West II
10:20 AM-12:00 PM	01-02 - Advanced Modelling for NDE	Brickstones
12:00PM	**END OF CONFERENCES/LUNCH ON OWN**	

* Subject to change

2022 Plenary Speakers

Monday, July 25th

Wieslaw Ostachowicz, Ph.D.

Polish Academy of Sciences
IFFM

Biography: Prof Wieslaw Ostachowicz graduated from Gdansk University of Technology, Poland (receiving the MSc, PhD and DSc degrees in Mechanical Engineering). He has led dynamics research at the Institute of Fluid-Flow Machinery, PAS, for over thirty-five years. Prof Ostachowicz has been visiting professor at the Syracuse University (1980–1981), an expert of UNIDO (United Nations Industrial Development Organization) at the Instituto de Investigaciones Electricas, Cuernavaca, Mexico (1987, 1990), visiting professor at the University of Glasgow, UK (2000–2003) and the Ecole Nationale Supérieure d'Arts et Métiers (ENSAM), Paris, France (2017).

Prof Ostachowicz published 435 archival international journal papers, 532 refereed international conference papers, and over 200 technical reports, predominantly in damage detection, structural health monitoring, and advanced signal processing areas. Prof Ostachowicz participated in investigating 24 international research projects as a coordinator, leader of WP (Work Package), or the main contractor, including the European Commission, NATO, EPSRC, US Army. Presently prof Ostachowicz is involved in work (as editor/associate editor) for the following journals: Mechanical Systems and Signal Processing (Elsevier), Structural Health Monitoring (SAGE Publ.), Intelligent Material Systems and Structures (SAGE Publ.), Smart Materials and Structures (IOP Publ.), ASME Jour.-Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems; Editorial Board Member, Strain (Wiley), Jour. of Mechanical Engineering Science (SAGE Publ.).

Prof Ostachowicz has received several prestigious awards and distinctions, among others Medal of O.C. Zienkiewicz (2013), Dragon–STAR Innovation Award (1st place) as confirmation of cooperation between Poland (Polish Academy of Sciences) and China (Hohai University and The Hong Kong Polytechnic University), 2015, and SHM Life Achievements Award (sponsored by Boeing Co.), Stanford University, USA (2019). See details in: ORCID 0000-0002-8061-8614

Lecture Title: Nondestructive Assessment of Structural Integrity for Lightweight Structures

Abstract: The paper presents the challenges of non–destructive assessment of structural integrity and failures for lightweight materials. As is well known, such a need results from the necessity to monitor the condition of joints in composite structures and during repairs of damaged structures.

In the initial part of the paper, motivations and research objectives are presented. For the most part, the study shows the inspection methods of composite structure joints. Before joining, the surface assessment methods and the quality assessment methods for structural joints are highlighted. Detailed descriptions of investigated cases are provided. In particular, a study of the surface of polymer reinforced carbon fibres samples (CFRP) with various degradation/contamination is presented.

The investigations of the condition for CFRP bonds are presented next. Particular attention was paid to the issues of various types of degradation, for example, moisture, anti-adhesive agent (release agent), fuel, hydraulic fluid (Skydrol), de-icer, thermal degradation, and improper adhesive curing, errors in bonding, fingerprint. Most of the types mentioned above of degradation pose a severe problem in the aerospace industry (both in manufacturing and service). They are possible sources of weak bonds.

In the central part of the presentation, various methods of NDT (nondestructive testing) and SHM (structural health monitoring) are discussed. In particular, the advantages and disadvantages of the following methods are presented: Electromechanical Impedance, Laser Fluorescence, Laser Vibrometry, Active Thermography and Terahertz Spectroscopy. Effective applications of these methods in testing aircraft components were indicated.

The paper presents the results of research on composite samples as well as small components of aircraft that were degraded due to moisture, initial stresses, thermal influence, icing, and chemical contaminations. Some interesting signal processing techniques were also introduced. Among other things, the effective use of Frechet distance and Mahalanobis distance was indicated. The methods mentioned in the previous sentence proved to be perfect for processing the signal obtained using Laser Doppler Vibrometry.

Tuesday, July 26th

Paul Wilcox, Ph.D.

University of Bristol
Fellow, Alan Turing Institute
Academic Director, UK Research Centre in NDE

Biography: Paul Wilcox is Professor of Dynamics at the University of Bristol, a Fellow of the Alan Turing Institute, and Academic Director of the UK Research Centre in NDE. He received an Engineering Science degree from the University of Oxford (1994) and a PhD from Imperial College London (1998). In 2015 he co-founded Inductosense Ltd., to commercialise inductively-coupled ultrasonic sensors. His research interests include arrays, guided waves, elastodynamic scattering, signal processing and machine learning.

Lecture Title: Applications of Data Science and Machine Learning to Ultrasonic Multi-view Imaging

Abstract: Full Matrix Capture (FMC) and image formation using variants of the Total Focusing Method (TFM) are now routinely available on commercial array controller instruments. However, forming a single image from FMC data only makes use of a small part of the rich information that it contains. Each individual A-scan in an FMC dataset contains superposed responses due to scattering from structural features due to waves that have propagated along multiple ray paths, possibly involving mode conversions and/or reflections. The formation of an image from FMC data assumes a single ray path with responses due to waves propagating on any other ray paths appearing as artefacts. Intuitively, exploiting information from multiple ray paths should improve the detection of defects especially if there is uncertainty about the nature and orientation of potential defects. The natural solution is to form multiple images from the same FMC data using different assumed ray paths; this is termed multi-view imaging.

However, multi-view imaging presents a new challenge of operator information overload, hence data reduction or automation is desirable. A statistical strategy for fusing information from multiple views is presented and shown to yield superior defect detection performance to any individual view. It is also shown how multi-view data can be used in a probabilistic framework for improving characterization of defects once detected.

However, for both detection and characterization, it is first necessary to identify and suppress benign artefacts in multi-view images. This is a task where machine learning can potentially provide an efficient solution and promising initial results will be presented. It is suggested that artefact suppression could be one of the most important and general applications of machine learning for all NDE modalities.

Wednesday, July 27th

Bernherd Tittmann, Ph.D.

Schell Professor of Engineering, Emeritus
Director of Engineering Nanostructure Characterization Center
Department of Engineering Science and Mechanics
The Pennsylvania State University

Biography: Bernhard R. Tittmann is the Schell Professor Emeritus and the director of the Engineering Nanostructure Characterization Center at the Penn State Department of Engineering Science and Mechanics. Throughout his career, he has also been a visiting professor or lecturer at the Johannes Kepler University in Linz, Austria, and in France at the University of Paris VII and the University of Paris III. He received his B.S. in physics and mathematics from George Washington University in Washington, DC, in 1957 and his Ph.D. in solid state physics from the University of California at Los Angeles, California, in 1965. He has also served on the technical staff in the Materials Mechanics and Physical Electronics Groups at the Science Center of Rockwell International (formerly North American Aviation), before serving as manager of Materials Characterization from 1979 to 1989. He was also the Howard Hughes Fellow in the microwave antenna department of the Hughes Research Lab in Culver City, CA from 1957 to 1962.

Tittmann has been a Fellow of the American Society for Metals (ASM) International, the Acoustical Society of America (ASA), and the Institute of Electrical and Electronics Engineering (IEEE).

Tittmann has been the recipient of many awards, including the Albert Nelson Marquis Lifetime Achievement Award through Marquis Who's Who in 2018 and the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society's Distinguished Service Award in 2017. In his career, he has graduated 11 Ph.D. students and 25 M.S. students, been awarded seven patents and three patent disclosures, and has authored or co-authored over 480 publications, including refereed journal publications and proceedings.

Lecture Title: Ultrasonic Transducers for Harsh Environments

Abstract: Ultrasonic transducers play a key role in many strategically important fields in health monitoring and nondestructive testing. Applications that use ultrasonic transducers include the medical, aerospace, railroad, marine, and energy-related industries. The heart of an ultrasonic transducer is the piezoelectric element. Transducers currently used in these industries primarily employ PZT5-H as the piezoelectric element for ultrasound transmission and detection. This material has a Curie–Weiss temperature that limits its use to about 210 °C. Some industrial applications require much higher temperatures, i.e., 350–1000 °C. Examples are heat engines, steam generators, heat exchangers, steam pipes, deep geological exploration, nuclear reactors, steel industries and more.

The goal of this presentation is to survey and review piezoelectric elements for use in high-temperature and some radiation environments for the ultimate purpose of structural health monitoring (SHM), non-destructive evaluation (NDE), and non-destructive material characterization (NDMC). The survey comprises the following categories:

1. High-temperature applications with single crystals;
2. Thick-film ceramics, and composite ceramics;
3. Sol–gel and spray-on transducers.

In the latter category, recent breakthroughs in the doping of certain ceramics have produced exciting new piezoelectric composites having substantial increases in the Curie temperatures. In each category, the known characteristics are listed, and examples are given of performance in harsh environments.

TECHNICAL PROGRAM

MONDAY, JULY 25, 2022

06-01: Machine Learning and Statistical Methods in NDE
7/25/2022
10:20 AM to 12:00 PM - Shutters East I

Chair: *Joel B. Harley - University of Florida*
Chair: *Laura Homa - University of Dayton Research Institute*
Authors:

Uncertainty Quantification for Deep Learning Applied to Ultrasonic Inline Pipe Inspection, {QNDE2022-94598} Technical Presentation Only
Richard Pyle - University of Bristol
Robert Hughes - University of Bristol
Amine Ait Si Ali - Baker Hughes
Paul Wilcox - University of Bristol

Ultrasonic Imaging Using Conditional Generative Adversarial Networks (Cgan), {QNDE2022-98567} Abstract
Nathan Molinier - Ecole de Technologie Superieure ETS
Guillaume Painchaud-April - Evident Industrial
Alain Leduff - Evident Industrial
Pierre Belanger - PULETS - Ecole de Technologie Superieur

Development of the Automated Defect Recognition System With Convolutional Neural Network Using Simulation Assisted Tfm Imaging in Ndt, {QNDE2022-98501} Abstract
Thulsiram Gantala - Indian Institute of Technology Madras, Chennai
Krishnan Balasubramaniam - Indian Institute of Technology Madras, Chennai

Thickness Estimation of Corrosion Profiles Using Ultrasonic Nde and Convolutional Neural Networks, {QNDE2022-98361} Abstract
Sergio Cantero-Chinchilla - University of Bristol
Christopher Simpson - University of Bristol
Alexander Ballisat - Centre For Modelling & Simulation
Anthony Croxford - University of Bristol
Paul Wilcox - University of Bristol

Towards Increasing the Resolution in Thickness Measurements Using Upsampled Data and Convolution Neural Network, {QNDE2022-98527} Abstract
Frederic Dupont - Nucléom - Ecole de Technologie Supérieure
Pierre Bélanger - École de technologie supérieure

19-01: Material Characterization by Ultrasonic waves
7/25/2022
10:20 AM to 12:00 PM - Shutters West I

Chair: *Paul Dryburgh - University of Nottingham*
Chair: *Yevgeniya Lugovtsova - BAM*

Authors:

Nondestructive State of Health Assessment of Second-Life Lithium-Ion Batteries Using Quantitative Ultrasound Spectroscopy, {QNDE2022-98073}
Technical Presentation Only
Simon Montoya-Bedoya - Verasonics SAS
Daniel Rohrbach - Verasonics Inc.
Esteban Garcia-Tamayo - BATx
Peter Kaczkowski - Verasonics Inc.
Alejandro Camargo - BATx
Hader V. Martinez-Tejada - Universidad Pontificia Bolivariana
Miguel Bernal - Verasonics SAS

Tracking the State of Charge in Operando of Second-Life Lithium-Ion Batteries Using Quantitative Ultrasound Spectroscopy at Different C-Rates, {QNDE2022-98150}
Technical Presentation Only
Simon Montoya-Bedoya - Verasonics SAS
Daniel Rohrbach - Verasonics Inc.
Esteban Garcia-Tamayo - BATx SAS
Peter Kaczkowski - Verasonics Inc.
Hader V. Martinez-Tejada - Universidad Pontificia Bolivariana, Grupo de investigación en Nuevos Materiales
Miguel Bernal - Verasonics SAS

A Validation Study of a Complex Composite Structure Using Data From Open Guided Waves, {QNDE2022-98225}
Abstract
Enes SAVLI - Fraunhofer Institute for Ceramic Technologies and Systems IKTS
Kilian Tschöke - Fraunhofer Institute for Ceramic Technologies and Systems IKTS
Lars Schubert - Fraunhofer Institute for Ceramic Technologies and Systems IKTS

Ultrasonic Metrics for Large-Area Rapid Wrinkle Detection, Classification and Quantification in Composites., {QNDE2022-98502}
Abstract
Robert Smith - University of Bristol
Rostand Tayong - University of Bedfordshire
Luke Nelson - University of Bristol
Paul Wilcox - University of Bristol

Towards Characterisation of Elastic Constants of Composite Materials by Means of Ultrasonic Guided Waves, {QNDE2022-98558}
Abstract
Yevgeniya Lugovtsova - Federal Institute for Materials Research and Testing (BAM)
Jannis Bulling - Federal Institute for Materials Research and Testing (BAM)
Jens Prager - Federal Institute for Materials Research and Testing (BAM)

07-01: NDE for Additive Manufacturing
7/25/2022
10:20 AM to 12:00 PM - Shutters East II

Chair: *Hoon Sohn - Korea Advanced Institute of Science and Technology (KAIST)*
Chair: *Peipei Liu - Korea Advanced Institute of Science and Technology (KAIST)*

Authors:

Online Monitoring of Internal Surface Roughness of Additively Manufactured Parts, {QNDE2022-98061}
Abstract

Zeqing Sun - Nanyang Technological University
Peng Zuo - Advanced Remanufacturing and Technology Centre (ARTC)
Zheng Fan - Nanyang Technological University

Damage Localization in 3d-Printed Plates With Different Infill Densities, {QNDE2022-95348}
Abstract
Mohammad Ali Fakih - Institute of Fluid Flow Machinery Polish Academy of Sciences
Shishir Singh - Institute of Fluid Flow Machinery Polish Academy of Sciences
Samir Mustapha - Laboratory of Smart Structures and Structural Integrity (SSSI), Department of Mechanical Engineering, American University of Beirut
Pawel Malinowski - Institute of Fluid Flow Machinery Polish Academy of Sciences

Comparison of Flaw Detection Algorithms Using Simulated X-Ray Computed Tomography Ground Truth Data and Evaluation Metrics, {QNDE2022-98319}
Abstract
Felix H. Kim - National Institute of Standards and Technology
Adam Pintar - National Institute of Standards and Technology
John Henry Scott - National Institute of Standards and Technology
Edward Garboczi - National Institute of Standards and Technology

Real-Time Additive Manufacturing Quality Enhancement in Pulse Laser-Assisted Metal Directed Energy Deposition, {QNDE2022-98280}
Abstract
Peipei Liu - Korea Advanced Institute of Science and Technology (KAIST)
Kiyoon Yi - Korea Advanced Institute of Science and Technology
Hansol Yoon - Korea Advanced Institute of Science and Technology
Hoon Sohn - Korea Advanced Institute of Science and Technology

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09-01: NDE Modeling and Prognostics for Composites
7/25/2022
10:20 AM to 12:00 PM - Shutters West II

Chair: *Elizabeth Gregory - NASA Langley Research Center*
Chair: *Portia Banerjee - NASA*
Authors:

Tracking Composite Plies Using Simulated Realistic Ultrasonic Fields, {QNDE2022-98285}
Abstract
Nikolay Pilashev - University of Bristol
Robert Smith - University of Bristol
Paul Wilcox - University of Bristol

Directionally Dependent Guided Wave Scattering for the Monitoring of Anisotropic Composite Structures, {QNDE2022-98367}
Abstract
Flora Hervin - UCL
Paul Fromme - UCL

Least Squares Reverse Time Migration (Lsrtm) for Damage Imaging in Composite Laminates, {QNDE2022-98553}
Technical Presentation Only

Jiaze He - The University of Alabama
Anthony Schwarberg - The University of Alabama
Erik Frankforter - NASA Langley Research Center

Improved Global-Local Method for Ultrasonic Guided Wave Scattering Predictions in Composite Waveguides and Defects, {QNDE2022-98808}

Abstract

Margherita Capriotti - San Diego State University
Luis Escalona - San Diego State University
Antonino Spada - Universita' degli Studi di Palermo

Hybrid Physical-Nde Data Driven Predictive Fatigue Life Evaluation of Adhesive Composite Joints, {QNDE2022-98845}
Abstract

Yuris Dzenis - UNIVERSITY of NEBRASKA–LINCOLN

17-01 Ultrasonic Arrays
7/25/2022
10:20 AM to 12:00 PM - Brickstones

Chair: *Paul Wilcox - University of Bristol*
Chair: *Sergio Cantero-Chinchilla - University of Bristol*
Authors:

Enhancing the Repeatability of Ultrasonic Array Imaging, {QNDE2022-97822}
Technical Presentation Only

Paul Wilcox - University of Bristol
Anthony Croxford - University of Bristol
Yuan Xue - University of Bristol

Fusion of Multi-View Instantaneous Phase Coherence Images, {QNDE2022-98231}
Abstract

Baptiste Gauthier - PULETS - Ecole de technologie superieure
Guillaume Painchaud-April - Evident Industrial
Alain Le Duff - Evident Industrial
Pierre Belanger - PULETS - Ecole de technologie superieure

Ultrasonic Imaging With Super-Resolution Based on Fast Deconvolution of Tfm Images, {QNDE2022-98528}
Abstract

Nans Laroche - TPAC
Ewen Carcreff - TPAC

Deep Learning-Based, Laser Ultrasonic Remote Tomography in Metals, {QNDE2022-98556}
Abstract

Peter Lukacs - University of Strathclyde
Jonathan Singh - University of Strathclyde
Matthew Riding - University of Strathclyde
Ahmed Alfuwaires - University of Strathclyde
Katy Tant - University of Strathclyde
Theodosia Stratoudaki - University of Strathclyde

Comparative Study of Advanced Image Reconstruction Algorithms for Arbitrary Surfaces, {QNDE2022-98489}
Abstract

Sumana - - University of Strathclyde
David Lines - University of Strathclyde
Charles N Macleod - University of Strathclyde
Simon Parke - PEAK NDT Limited

05-01: Guided Waves I
7/25/2022
1:20 PM to 3:00 PM - Shutters West II

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

Authors:

Numerical Analysis of Guided Wave Transmission Through a Rail Containing Numerous Small Cracks, {QNDE2022-98277}
Abstract
Philip Loveday - University of the Witwatersrand

Integrated Modelling of Guided Waves Reflections From Defects in Pipes, {QNDE2022-98197}
Abstract
Abdul Mateen Qadri - Imperial College London
Peter Huthwaite - Imperial College London
Michael Lowe - Imperial College London
Thomas Vogt - Guided Ultrasonics Ltd

Numerical Application of Guided Wave Tomography Based on Full Waveform Inversion for a Pipe Bend, {QNDE2022-97567}
Abstract
Carlos Omar Rasgado Moreno - Tallinn University of Technology
Madis Ratassepp - Tallinn University of Technology

Guided Waves in Pipes Versus Lamb Waves in Plates: A Convergence Analysis, {QNDE2022-98270}
Abstract
Fadhel Alsaffar - University of California Los Angeles
Lifu Wang - University of California Los Angeles
Ajit Mal - University of California Los Angeles
Christoph Schaal - California State University Northridge

Geometrical Full Waveform Inversion of Pipe Corrosion With Limited Access, {QNDE2022-98519}
Abstract
Richard Eager - Imperial College London
Peter Huthwaite - Imperial College London

19-03: Material Characterization by Ultrasonic waves
7/25/2022
1:20 PM to 3:00 PM - Shutters West I

Chair: *Paul Dryburgh - University of Nottingham*
Chair: *Yevgeniya Lugovtsova - BAM*

Authors:

Ultrasonic Methods for Characterising the Fatigue State of Steel Components, {QNDE2022-96889}
Abstract
Georgios Sarris - Imperial College London
Michael Lowe - Imperial College London
Peter Huthwaite - Imperial Colege London
Stewart Haslinger - The University of Liverpool

Experimental and In-Service Observations of Hic Nucleation and Growth in Pipeline Steel, {QNDE2022-97160}
Abstract
Ehsan Entezari - Instituto Politécnico Nacional (IPN)
Jorge Luis González Velázqueza - Instituto Politécnico Nacional (IPN)
Perla Karina Vásquez Perales - Mexico-Instituto Politécnico Nacional (IPN)
Diego Rivas López - Instituto Politécnico Nacional (IPN)
Jerzy Szpunar - University of Saskatchewan
Manuel Alejandro Beltrán Zúñiga - Instituto Politécnico Nacional (IPN)
Joaquín Everardo Gámiz Serranoa - Instituto Politécnico Nacional (IPN)

Microstructure Characterization of Binder Jet 316l Stainless Steel Components Using Ultrasound, {QNDE2022-97708}
Technical Presentation Only

Andrea Argüelles - Penn State University
Olivia Cook - Penn State University
Nancy Huang - Penn State University
Robert Smithson - 3M Company
Christopher Kube - Penn State University
Allison Beese - Penn State University

Non-Destructive Evaluation of Microscopic Biology: Using Nano-Elasticity as a Biomarker for Disease, {QNDE2022-99164}
Abstract

Salvatore La Cavera - University of Nottingham
Fernando Perez-Cota - University of Nottingham
Rafael Fuentes-Dominguez - University of Nottingham
Richard Smith - University of Nottingham
Matt Clark - University of Nottingham

06-02: Machine Learning and Statistical Methods in NDE
7/25/2022
1:20 PM to 3:00 PM - Shutters East I

Chair: *Joel B. Harley - University of Florida*
Chair: *Laura Homa - University of Dayton Research Institute*
Authors:

Multimodal Data Fusion Techniques and Applications, {QNDE2022-98161}
Technical Presentation Only

Nick Lorenzo - University of Dayton Research Institute
Laura Homa - University of Dayton Research Institute
John Wertz - Air Force Research Laboratory
Matt Cherry - Air Force Research Laboratory
Sean O'rourke - Air Force Research Laboratory
Theresa Scarnati - Qualis Corporation

A Machine Learning Method for Microtexture Region Segmentation Using Eddy Current Data, {QNDE2022-97797}
Technical Presentation Only

Laura Homa - University of Dayton Research Institute
Nick Lorenzo - University of Dayton Research Institute
Matthew Cherry - AFRL/RXCA
John Wertz - AFRL/RXCA

Classifying Unique Grain Growth Behavior With a Convolutional Neural Network, {QNDE2022-98308}
Abstract

Ishan D. Khurjekar - University of Florida
Bryan Conry - University of Florida
Joseph Melville - University of Florida
Michael R. Tonks - University of Florida
Michael S. Kesler - Oak Ridge National Laboratory
Amanda R. Krause - University of Florida
Joel B. Harley - University of Florida

Automated Computed Tomography Data Evaluation Supported by Ai for Additive Manufactured Parts, {QNDE2022-97897}
Technical Presentation Only

Rainer Stoessel - Airbus Defence and Space GmbH; Airbus CRT
Klaus Schertler - Airbus Defence and Space GmbH; Airbus CRT
Christian Keimel - Airbus Defence and Space GmbH; Airbus CRT
Akshat Tandon - Airbus Defence and Space GmbH; Airbus CRT

Segmentation of Pores in Carbon Fibre Reinforced Polymers Using the U-Net Convolutional Neural Network, {QNDE2022-93998}
Abstract

Miroslav Yosifov - University of Applied Sciences Upper Austria
Patrick Weinberger - University of Applied Sciences Upper Austria
Bernhard Plank - University of Applied Sciences Upper Austria
Markus Hoeglinger - University of Applied Sciences Upper Austria
Bernhard Fröhler - University of Applied Sciences Upper Austria
Johann Kastner - University of Applied Sciences Upper Austria
Christoph Heinzl - University of Applied Sciences Upper Austria

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07-02: NDE for Additive Manufacturing
7/25/2022
1:20 PM to 3:00 PM - Shutters East II

Chair: *Hoon Sohn - Korea Advanced Institute of Science and Technology (KAIST)*
Chair: *Peipei Liu - Korea Advanced Institute of Science and Technology (KAIST)*
Authors:

In-Process Non-Destructive Evaluation of Wire + Arc Additive Manufacture Components Using Ultrasound High-Temperature Dry-Coupled Roller-Probe, {QNDE2022-98397}
Abstract

Rastislav Zimermann - University of Strathclyde
Ehsan Mohseni - university of strathclyde
Momchil Vasilev - university of Strathclyde
Charalampos Loukas - University of Strathclyde
Randika Vithanage - University of Strathclyde
Charles Macleod - University of Strathclyde
David Lines - University of Strathclyde
Misael Pimentel - National Manufacturing Institute Scotland, University of strathclyde

Stephen Fitzpatric - National Manufacturing Institute Scotland, University of Strathclyde
Steven Halavage - National Manufacturing Institute Scotland, University of Strathclyde
Scott Mckegney - National Manufacturing Institute Scotland, University of Strathclyde
Gareth Pierce - University of Strathclyde
Stewart Williams - Cranfield University
Jialuo Ding - Cranfield University

Nonlinear Wave Mixing Technique for the Characterization of Additively Manufactured Metals Using Phased Arrays, {QNDE2022-98082}
Technical Presentation Only

Aurelio Bellotti - Georgia Institute of Technology
Jin-Yeon Kim - Georgia Institute of Technology
Donald Vanderlaan - Georgia Institute of Technology
Laurence Jacobs - Georgia Institute of Technology

Using an Ultrasonic Spectroscopy Technique for Additive Manufacturing (Am) In-Situ Monitoring, {QNDE2022-98144}
Technical Presentation Only

Janelle Chambers - Southern Research

Surface Acoustic Wave Suppression for Near-Surface Defect Imaging Using Laser Induced Phased Arrays, {QNDE2022-98293}
Abstract

Geo Davis - University of Strathclyde
Ahmed Al Fuwaires - University of Strathclyde
Panagiotis Kamintzis - University of Strathclyde
Peter Lukacs - University of Strathclyde

Alan Keenan - University of Strathclyde
Don Pieris - University of Strathclyde
Theodosia Stratoudaki - University of Strathclyde

Detecting Sub-Surface Defects in Additively Manufactured Metal Parts With Laser-Generated Ultrasonic Rayleigh Waves, {QNDE2022-98218}
Technical Presentation Only
Xingfang Cai - Nanyang Technological University
Zheng, David Fan - Nanyang Technological University

17-02 Ultrasonic Arrays
7/25/2022
1:20 PM to 3:00 PM - Brickstones

Chair: *Paul Wilcox - University of Bristol*
Chair: *Sergio Cantero-Chinchilla - University of Bristol*
Authors:

Dual-Tandem Phased Array Inspection for Imaging of Near-Vertical Defects, {QNDE2022-98233}
Abstract
Ewan Nicolson - University of Strathclyde
Charles Macleod - University of Strathclyde
Ehsan Mohseni - University of Strathclyde
Dave Lines - University of Strathclyde
Gareth Pierce - University of Strathclyde

Robotic Ultrasonic Phased Array Inspection: A Global Tfm Approach., {QNDE2022-98313}
Technical Presentation Only

Jorge Mansur Rodrigues - Ecole de technologie superieure ETS Montreal
Pierre Belanger - Ecole de technologie superieure ETS Montreal

Use of Orthogonal Coded Signals to Increase the Rate of Data Acquisition in Plane-Wave Imaging, {QNDE2022-98248}
Technical Presentation Only
Kanav Prashar - University of Bristol
Bruce Drinkwater - University Of Bristol
Miles Weston - TWI LTD

A Compressive Sensing Strategy for Sparse-Tfm Ultrasonic Imaging, {QNDE2022-98431}
Abstract
Lucas Piedade - Ecole de technologie superieure
Guillaume Painchaud-April - Olympus NDT Canada
Alain Le Duff - Olympus NDT Canada
Pierre Bélanger - Ecole de technologie superieure

Nonlinear Beamforming Based on Amplitude Coherence Applied to Ultrasonic Imaging of Coarse-Grained Steels, {QNDE2022-98389}
Abstract
Ewen Carcreff - The Phased Array Company

05-02: Guided Waves II
7/25/2022
3:30 PM to 5:30 PM - Shutters West II

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

Authors:

Nonlinear Aspects of Plate Waves Disturbed by a Fatigue Crack: From Modelling to Applications, {QNDE2022-92265}
Abstract
Zhongqing Su - The Hong Kong Polytechnic University
Lei Xu - The Hong Kong Polytechnic University

Application of Mindlin Theory to Describe the Scattering of Guided Waves From Notches in a Plate, {QNDE2022-98050}
Technical Presentation Only
Usman Rasheed - Tallinn University of Technology (Taltech)
Martin Lints - Tallinn University of Technology
Madis Ratassepp - Tallinn University of Technology

Guided Wave Modeling by Recursive One-Way Wavefield Extrapolation, {QNDE2022-98090}
Abstract
Emiel Hassefras - TNO
Martin Verweij - Delft University of Technology
Arno Volker - TNO

Dispersion Properties of Leaky Waves Using Spectral Collocation Methods, {QNDE2022-97747}
Abstract
Evripides Georgiades - Imperial College London
Michael Lowe - Imperial College London
Richard Craster - Imperial College London

Generalized Analytical Solution for Guided Wave Propagation in Anisotropic Corrugated Wave Guides, {QNDE2022-98516}
Abstract
Hossain Ahmed - Georgia Southern University
Khaleda Akter - Georgia Southern University
Sourav Banerjee - University of South Carolina

19-02: Material Characterization by Ultrasonic waves
7/25/2022
3:30 PM to 5:30 PM - Shutters West I

Chair: *Paul Dryburgh - University of Nottingham*
Chair: *Yevgeniya Lugovtsova - BAM*
Authors:

Characterization of Polycrystalline Microstructures by Wavenumber-Filtering of Ultrasonic Field Data, {QNDE2022-98238}
Abstract
Zeqing Sun - Nanyang Technological University
Shangzi Wu - Xi'an Jiaotong University, Nanyang Technological University
Zheng Fan - Nanyang Technological University

Characterisation of Macrozones in Titanium Alloys Using Ultrasonic Testing, {QNDE2022-98265}
Technical Presentation Only
Wei Yi Yeoh - Imperial College London
Bo Lan - Imperial College London
Michael Lowe - Imperial College London

Ultrasonic Inspection of Rolled Microtextured Titanium Alloy, {QNDE2022-97809}
Technical Presentation Only
Abhishek Saini - Nanyang Technological University Singapore
Zheng Fan - Nanyang Technological University Singapore

Polycrystalline Reconstruction Based on 2d Ultrasound Computed Tomography, {QNDE2022-98443}
Technical Presentation Only
Jiaze He - University of Alabama
Dmitry Borisov - The University of Kansas
Jacob Fleming - The University of Alabama
Matthew Kasemer - The University of Alabama

Sras++: Single-Crystal Elasticity Measurements in Polycrystalline Materials, {QNDE2022-98548}
Abstract
Paul Dryburgh - University of Nottingham
Wenqi Li - University of Nottingham
Rikesh Patel - University of Nottingham
Richard Smith - University of Nottingham
Matt Clark - University of Nottingham

06-03: Machine Learning and Statistical Methods in NDE
7/25/2022
3:30 PM to 5:30 PM - Shutters East I

Chair: *Joel B. Harley - University of Florida*
Chair: *Laura Homa - University of Dayton Research Institute*

Authors:

Finite Element Augmented Training Data for Machine Learning of Defect Detection in Guided Wave Testing, {QNDE2022-97374}
Technical Presentation Only
Mikolaj Mroszczak - Imperial College London
Stefano Mariani - Guided Ultrasonics Limited
Peter Huthwaite - Imperial College London

Adaptive Damage Detection Thresholds for Guided Wave Structural Health Monitoring, {QNDE2022-98521}
Abstract
Piero Paialunga - University of Cincinnati
Joseph Corcoran - University of Cincinnati

Artefact Suppression in Nde Data Using Principal Component Analysis and Autoencoders, {QNDE2022-98289}
Abstract
Sergio Cantero-Chinchilla - University of Bristol
Paul Wilcox - University of Bristol
Anthony Croxford - University of Bristol

15-01: Structural Health Monitoring
7/25/2022
3:30 PM to 5:30 PM - Shutters East II

Chair: *Wiesław Ostachowicz - Polish Academy of Sciences*
Chair: *Tribikram Kundu - Univ Of Arizona*
Authors:

Shm Ndt Application on Airbus Aircraft – Qualification Process and 1st Application Cases, {QNDE2022-97228}
Technical Presentation Only
Aurelien RAUTUREAU - AIRBUS OPERATIONS SAS
Benjamin Eckstein - Airbus Operations GmbH

Real-Time Evaluation of Additive Manufacturing Parts Using Laser Vibrometer Combined With Shock Tube, {QNDE2022-97949}
Abstract

Han Liu - Iowa State University
Simon Laflamme - Iowa State University
Sarah Bentil - Iowa State University

Numerical Simulation of a Fast Technique for Damage Localization in Composite Laminates, {QNDE2022-97185}
Abstract

Zixian Zhou - Jilin University
Zhiwen Cui - Jilin University
Tribikram Kundu - The University of Arizona

The Use of Circumferential Guided Waves to Monitor Axial Cracks in Pipes, {QNDE2022-100343}
Abstract

Euan Rodgers - Imperial College London
Stefano Mariani - Imperial College London
Peter Cawley - Imperial College London

20-01: Online NDE techniques for smart manufacturing
7/25/2022
3:30 PM to 5:30 PM - Brickstones

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

Towards Inline Material Microstructure Imaging Using Spatially Resolved Acoustic Spectroscopy (Sras), {QNDE2022-98602}
Abstract

Rikesh Patel - University of Nottingham
Wenqi Li - University of Nottingham
Rafael Fuentes-Dominguez - University of Nottingham
Paul Dryburgh - University of Nottingham
Richard Smith - University of Nottingham
Matt Clark - University of Nottingham

Automated Compensation for In-Process Ultrasonic Additive & Weld Inspection, {QNDE2022-98525}
Abstract

Charles Macleod - University of Strathclyde
Euan Foster - University of Strathclyde
Nina Sweeney - University of Strathclyde
Ewan Nicolson - University of Strathclyde
David Lines - University of Strathclyde
Ehsan Mohseni - University of Strathclyde
Katherine Tant - University of Strathclyde
Stephen Gareth Pierce - University of Strathclyde
Anthony Gachagan - University of Strathclyde

Evaluation and Comparison of Two Deep-Learning Strategies for On-Line X-Ray Computed Tomography, {QNDE2022-98387}
Abstract

Vo Romain - CEA
Julie Escoda - Université Paris Saclay, CEA, List
Caroline Vienne - Université Paris Saclay, CEA, List
Étienne Decencière - MINES ParisTech - PSL Research University

Sparse-View X-Ray Ct Reconstruction Using Cad Model Registration, {QNDE2022-98042}
Technical Paper Publication (Iran)

Victor Bussy - Université Paris-Saclay, CEA, List
Caroline Vienne - Université Paris-Saclay, CEA, List
Julie Escoda - Université Paris-Saclay, CEA, List
Valérie Kaftandjian - Univ Lyon, INSA Lyon, LVA, EA677

In-Process Phased Array Ultrasonic Inspection During Fusion Welding, {QNDE2022-98283}
Abstract

Charles Macleod - University of Strathclyde
David Lines - Univeristy of Strathclyde
Randika Vithanage - Univeristy of Strathclyde
Momchil Vasilev - Univeristy of Strathclyde
Charalampos Loukas - University of Strathclyde
Nina Sweeney - University of Strathclyde
Euan Foster - University of Strathclyde
Ehsan Mohseni - University of Strathclyde
Yashar Javadi - University of Strathclyde

Gordon Dobie - University of Strathclyde
Stephen Gareth Pierce - Univeristy of Strathclyde
Anthony Gachagan - University of Strathclyde
Nick King - Cavendish Nuclear
Paul Applequist - University of Strathclyde
Anthony Burnett - Cavendish Nuclear
Colin Murray - Cavendish Nuclear
Ryan Whitmore - Cavendish Nuclear
Peter Robinson - Cavendish Nuclear
Albert Holt - Doosan Babcock
Mark Symington - Doosan Babcock

Towards Real-Time Ultrasound Driven Inspection and Control of Gta Welding Processes for High-Value Manufacturing, {QNDE2022-98290}
Abstract

Nina E. Sweeney - University of Strathclyde
Charles N. Macleod - University of Strathclyde
Ewan Nicolson - University of Strathclyde
David Lines - University of Strathclyde
Simon Parke - Peak NDT Ltd
Stephen G. Pierce - University of Strathclyde

TUESDAY, JULY 26, 2022

21-01: Poster Session
7/26/2022
9:50 AM to 10:20 AM - South Foyer

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

Machine Learning Inversion to Experimental Dispersion Curves for Characterizing Thin Coatings, {QNDE2022-98008}
Poster

Charles Tenorio - Georgia Institute of Technology
Maximilian Schmitz - Georgia Institute of Technology
Jin-Yeon Kim - Georgia Institute of Technology
David Torello - Georgia Institute of Technology
Laurence Jacobs - Georgia Institute of Technology

Noncontact Nonlinear Resonance Ultrasound Spectroscopy for Evaluation of Thermal Damage in Carbon/carbon Composites, {QNDE2022-98096}
Poster

Keshav Bhat - Georgia Institute of Technology
Jin-Yeon Kim - Georgia Institute of Technology
Aaron Stebner - Georgia Institute of Technology
Laurence Jacobs - Georgia Institute of Technology

Development of Lamination Layer Signal Cancellation Technique for Cfrp Composite Using Autoencoder, {QNDE2022-98347}
Poster

Yun-Taek Yeom - SungKyunKwan University
Seung-Eun Lee - Sungkyunkwan University
Hak-Joon Kim - Sungkyunkwan University
Sung-Jin Song - Sungkyunkwan University
Hun-Hee Kim - DooSan Enerbility

Residual Stress Evaluation for Peening Superalloy Using Non-Destructive Evaluation Techniques, {QNDE2022-98454}
Poster

Yeong-Won Choi - SKKU(SungKyunKwan Univ.)
Sung-Jin Song - Sungkyunkwan University
Hak-Joon Kim - Sungkyunkwan University
Yun-Taek Yeom - Sungkyunkwan University
Hun-Hee Kim - Doosan Heavy Industries and Construction Co.
Ki-Yeong Lee - KPC metal co.

Inspection of Adhesive Lap Joints Using Non-Linear Fundamental Shear Horizontal Wave Mode, {QNDE2022-98863}
Poster

Akhil Balachandran - Indian Institute of Technology Madras, India
Krishnan Balasubramanian - Indian Institute of Technology Madras

Nonlinear acoustics and acoustic emission for the Non-destructive testing and structural health monitoring of a recyclable polymer matrix composite material reinforced with flax fibers using integrated piezoelectric sensors, {QNDE2022-99125}
Poster

Rachid El Guerjouma - LAUM - Le Mans University - CNRS

Ultrasonic Digital Twin of Additively Manufactured Samples, {QNDE2022-98255}
Poster

Zebadiah Miles - Michigan State University
Adarsh Krishnamurthy - Iowa State University
Sunil Chakrapani - Michigan State University

Ultrasonic Evaluation of Paint Canisters, {QNDE2022-98284}
Poster

Kiran Kumar Amireddy - Chaitanya Bharathi Institute of Technology
Venkata Sushma Chinta - Chaitanya Bharathi Institute of Technology
Indira Priyadarshni Ch - Chaitanya Bharathi Institute of Technology

Sensitivity Analysis of a Finite Element Model of Ultrasonic Wave Propagation to Variations in the Representative Volume Element, {QNDE2022-98306}
Poster

Emmeline Evans - Georgia Institute of Technology
Jin-Yeon Kim - Georgia Institute of Technology
Aaron Stebner - Georgia Institute of Technology
Laurence Jacobs - Georgia Institute of Technology

Nonlinear Ultrasonic Techniques for the Quantification of Thermal Damage in Carbon/carbon Composite Material, {QNDE2022-98316}

Poster

Fabian Gmeiner - School of Civil and Environmental Engineering, Georgia Institute of Technology
Jin-Yeon Kim - School of Civil and Environmental Engineering, Georgia Institute of Technology
Laurence J. Jacobs - School of Civil and Environmental Engineering & G.W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology

Interaction of Shear Horizontal Guided Waves With Small Defects, {QNDE2022-98402}
Poster

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

Age Prediction of Thermal Barrier Coatings Using Thermography, {QNDE2022-98452}
Poster

Sruthi Krishna K P - Indian Institute of Technology Madras
Nithin Puthiyaveettil - Indian Institute of Technology Madras
V Srinivasa Chakravarthy - Indian Institute of Technology Madras
Krishnan Balasubramanian - Indian Institute of Technology Madras

A Study on Flaw Signal Detection for Phased Array Ultrasonic Testing Using Artificial Intelligence, {QNDE2022-88176}
Poster

Jinhyun Park - Sungkyunkwan University
Hak-Joon Kim - Sungkyunkwan University
Sung-Jin Song - Sungkyunkwan University
Sung-Sik Kang - Korea Institute of Nuclear Safety

In Situ Nonlinear Longitudinal Wave Technique to Correlate β to the Tensile Plastic Deformation of Stainless Steel 316l, {QNDE2022-98131}
Poster

Hyelim Do - University of Illinois, Urbana-Champaign
Kathryn Matlack - University of Illinois at Urbana-Champaign

05-03: Guided Waves III
7/26/2022
10:20 AM to 12:00 PM - Shutters West II

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

Ultrasonic Guided Wave Propagation for Aircraft Icing to Enhance Aviation Safety Measures, {QNDE2022-90192}
Abstract

Dr. SAURABH GUPTA - Vellore Institute of Technology
Paras Pravin Wategave - Vellore Institute of Technology

Sensor Placement Optimization Studies in Composite Structures Using Ultrasonic Lamb-Wave Toolbox, {QNDE2022-98487}
Abstract

Kaleeswaran Balasubramaniam - Institute of Fluid Flow Machinery Polish Academy of Sciences
Mohammad Ali Fakih - Institute of Fluid Flow Machinery Polish Academy of Sciences
Paweł Malinowski - Institute of Fluid-Flow Machinery Polish Academy of Sciences

Anisotropy Influence on Guided Wave Propagation and Steering in Unidirectional Cfrp, {QNDE2022-98375}
Abstract

Flora Hervin - UCL

Paul Fromme - UCL

Realistic Model-Based Reliability Estimation of Guided Wave Monitoring Systems, {QNDE2022-98163}
Abstract
Panpan Xu - Imperial College London
Peter Huthwaite - Imperial College London
Robin Jones - Guided Ultrasonics Limited

Numerical Guided Wave Analysis of an Isotropic Structure With Optical Fiber Bragg Grating Sensors, {QNDE2022-97500}
Abstract

Kaleeswaran Balasubramaniam - Institute of Fluid Flow Machinery Polish Academy of Sciences
Rohan Soman - Institute of Fluid Flow Machinery Polish Academy of Sciences
Wiesław Ostachowicz - Institute of Fluid Flow Machinery Polish Academy of Sciences
Paweł Malinowski - Institute of Fluid Flow Machinery Polish Academy of Sciences

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06-04: Machine Learning and Statistical Methods in NDE
7/26/2022
10:20 AM to 12:00 PM - Shutters East I

Chair: *Joel B. Harley - University of Florida*
Chair: *Laura Homa - University of Dayton Research Institute*
Authors:

Learning Wave Modes From Neuromorphic Cameras: A Feasibility Study, {QNDE2022-98269}
Abstract
Kevin Tandi - University of Florida
Hannah Kempfert - University of Florida
Katie Burstiner - University of Florida
Joel B. Harley - University of Florida

Imaged Based Evaluation of Concrete Damage Using Scale Invariant Feature Transform, {QNDE2022-98579}
Abstract
Yalei Tang - University of Nebraska, Lincoln
Jinying Zhu - University of Nebraska, Lincoln

Registration and Segmentation of Impact Damage in Polymer Matrix Composite Panels From Ultrasound Data, {QNDE2022-98767}
Abstract
Tineka Witt - University of Dayton Research Institute
Tyler Lesthaeghe - University of Dayton Research Institute
John Wertz - Air Force Research Laboratory
John Aldrin - Computational Tools

Towards Computational Super-Resolution Ultrasonic Array Imaging of Material Defects via Hierarchical Multi-Scale Deep Learning With Uncertainty Quantification, {QNDE2022-98563}
Technical Presentation Only
Yongchao Yang - Michigan Technological University
Homin Song - Gachon University

17-03 Ultrasonic Arrays
7/26/2022
10:20 AM to 12:00 PM - Brickstones

Chair: *Paul Wilcox - University of Bristol*
Chair: *Sergio Cantero-Chinchilla - University of Bristol*
Authors:

Surface Crack Sizing Method Using Rayleigh Waves Generated by Ultrasonic Phased Arrays, {QNDE2022-98309}
Abstract
Bhupesh Verma - École de technologie supérieure ÉTS, Montreal, Quebec
Pierre Bélanger - École de technologie supérieure ÉTS, Montreal, Quebec

Real-Time 3d Ultrasonic Array Imaging and Its Application to Non-Destructive Testing in Additive Manufacturing, {QNDE2022-98510}
Abstract
Maxance Marmonier - CEA LIST
Sébastien Robert - CEA LIST
Jérôme Laurent - CEA LIST
François Cartier - CEA LIST
Claire Prada - ESPCI Paris CNRS

Pod Analysis of Paut in Lieu of Rt for the Nondestructive Inspection of Tube Welds in Thermal Power Plant Facilities, {QNDE2022-98226}
Abstract
Ikkeun Park - Seoul National University of Science and Technology
Yumin Choi - Seoul National University of Science and Technology
Sungjong Cho - Seoul National University of Science and Technology
Jeong Su Lee - Korea Western Power co., Ltd.
Cheolgyu Baek - Korea Western Power co., Ltd.

Sizing Non-Sharp Defects Using Tfm Images, {QNDE2022-97570}
Technical Presentation Only
Shivaprasad Bhat - University of Bristol
Jie Zhang - University of Bristol
Nicolas Larrosa - University of Bristol

12-01: Nonlinear Ultrasonics
7/26/2022
10:20 AM to 12:00 PM - Shutters West I

Chair: *Christopher Kube - The Pennsylvania State University*
Chair: *Laurence Jacobs - Georgia Tech*
Authors:

Layer-by-Layer Monitoring of Additive Manufacturing With Laser-Generated Rayleigh Waves, {QNDE2022-98506}
Technical Presentation Only
Cliff Lissenden - Penn State
Chaitanya Bakre - Penn State

In Situ Nonlinear Rayleigh Wave Technique to Correlate β to Fatigue Life, {QNDE2022-98035}
Abstract
Changgong Kim - University of Illinois At Urbana-Champaign
Kathryn Matlack - University of Illinois at Urbana-Champaign

Dynamic Acoustoelastic Testing (Daet) With a Thermal Strain Pump for In-Situ Characterization of Closed Fatigue Cracks in Aluminum, {QNDE2022-97580}
Abstract
Prabhakaran Manogharan - The Pennsylvania State University
Parisa Shokouhi - The Pennsylvania State University

Real-Time Structural Health Monitoring of Concrete Using the Non-Linear Ultrasonic Spc-I Technique, {QNDE2022-98407}
Abstract

Umar Amjad - The University of Arizona
Hamad N. Alnuaimi - The University of Arizona
Arash Nikvar-Hassani - The University of Arizona

Imraan Bokhari - The University of Arizona
Lianyang Zhang - The University of Arizona
Tribikram Kundu - The University of Arizona

A Non-Linear Ultrasonic Approach Using a Fine-Tuned Experimentally Defined Frequency for Structural Health Monitoring of Composite Plates, {QNDE2022-98012}
Abstract

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

04-01: Electromagnetic NDE Techniques
7/26/2022
10:20 AM to 12:00 PM - Shutters East II

Chair: *John Wertz - Air Force Research Laboratory*
Authors:

Eddy Current Parameters Optimization to Assist Field Application, {QNDE2022-98022}
Abstract

Lucas Campos - Laboratory of Non-Destructive Testing, Corrosion and Welding (LNDC/COPPE/UFRJ)
Cesar Camerini - Federal University of Rio de Janeiro (UFRJ)
Vitor Silva - Laboratory of Non-Destructive Testing, Corrosion and Welding (LNDC/COPPE/UFRJ)
Lucas Silva - Laboratory of Non-Destructive Testing, Corrosion and Welding (LNDC/COPPE/UFRJ)
Rafael Santos - Petrobras
Gabriela Pereira - Federal University of Rio de Janeiro (UFRJ)

3d Electrical Impedance Tomography for Localizing Damage in Additively Manufactured Metal Lattice Structures, {QNDE2022-98155}
Technical Presentation Only

Yening Shu - University of California San Diego
Saptarshi Mukherjee - Lawrence Livermore National Laboratory
Tammy Chang - Lawrence Livermore National Laboratory
Joseph Tringe - Lawrence Livermore National Laboratory
David Stobbe - Lawrence Livermore National Laboratory
Kenneth Loh - UC San Diego

Use of Eddy Currents in the Detection of Corrosion in Thick-Walled Steel, Through Permeability Distortion Near Its Surface, {QNDE2022-98236}
Abstract

Vitor Silva - COPPE/UFRJ
Cesar Camerini - Universidade Federal do Rio de Janeiro
Lucas Campos - Universidade Federal do Rio de Janeiro
Caio Souza - Universidade Federal do Rio de Janeiro
Gabriela Pereira - Universidade Federal do Rio de Janeiro

Probability of Detection of Fatigue Cracks With Eddy Current Array Probe, {QNDE2022-98554}
Abstract

Aparna Sheila-Vadde - GE Research

Aditya Kulkarni - GE Research
Prasad Thapa - GE Research
Manoj Kumarkm - GE Research

05-04: Guided Waves IV
7/26/2022
1:20 PM to 3:00 PM - Shutters West II

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

Material Property Estimation in Thin Battery Components Using Guided Wave Measurement, Experimental Dispersion Curve Extraction and Finite Element Modeling, {QNDE2022-98557}
Abstract
Peter Juarez - NASA Langley Research Center
Erik Frankforter - NASA
William Nelson - The University of Virginia

Investigation of Low Frequency Guided Waves for Cast Austenitic Stainless Steel, {QNDE2022-98240}
Abstract
Michael Quarry - Electric Power Research Institute

Optimised Shear Horizontal Guided Wave Inspection Set-Up for Titanium Welds, {QNDE2022-98089}
Abstract
Christian Peyton - University of Wariwck
Steve Dixon - University of Warwick
Ben Dutton - The Manufacturing Technology Centre
Wilson Vesga - The Manufacturing Technology Centre
Rachel S. Edwards - University of Warwick

Crawler-Based Automated Non-Contact Ultrasonic Inspection of Large Structural Assets, {QNDE2022-97910}
Technical Presentation Only
Morteza Tabatabaeipour - University of Strathclyde
Ross Mcmillan - University of Strathclyde
Konstantinos Tzaferis - University of Strathclyde
William Jackson - University of Strathclyde
Rachel S. Edwards - University of Warwick
Oksana Trushkevych - University of Warwick
Charles Macleod - University of Strathclyde
Gordon Dobie - University of Strathclyde
Anthony Gachagan - University of Strathclyde

Stress Relaxation Monitoring in Prestressed Multi-Layered Structures, {QNDE2022-98518}
Abstract
Xizhong Wu - Beihang University
Jingjing He - Beihang University
Xuefei Guan - Graduate School of China Academy of Engineering Physics

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12-02: Nonlinear Ultrasonics
7/26/2022
1:20 PM to 3:00 PM - Shutters West I

Chair: *Christopher Kube - The Pennsylvania State University*
Chair: *Laurence Jacobs - Georgia Tech*

Authors:

Proposal of a Standard to Measure Relative Ultrasonic Nonlinearity Parameters, {QNDE2022-98346}
Technical Presentation Only
Kyung-Young Jhang - Hanyang University
Ji-Woong Yoo - Hanyang University
Dong-Gi Song - Hanyang University

Use of a Non-Collinear Wave Mixing Technique to Image Internal Microscale Damage in Concrete, {QNDE2022-98065}
Technical Presentation Only
Contact: Laurence Jacobs - Georgia Institute of Technology

Monitoring of Axially Loaded Bolts Through Harmonic Generation Measurements, {QNDE2022-98360}
Abstract
Hyunjo Jeong - Wonkwang University

A Unifying Framework for Nonlinear Elastic Waves Used in Nondestructive Evaluation, {QNDE2022-98258}
Abstract
Christopher Kube - The Pennsylvania State University
Anubhav Roy - Penn State
Daniel Jensen - Sandia National Laboratories
Darren Branch - Sandia National Laboratories

Predictive Modeling of the Nonlinearity Parameter β Through Precipitate Nucleation and Growth Modeling, {QNDE2022-97914}
Abstract
Brian Fuchs - Georgia Institute of Technology
Jin-Yeon Kim - Georgia Institute of Technology
Laurence Jacobs - Georgia Institute of Technology

10-01: NDE/SHM for Oil & Gas Industry
7/26/2022
1:20 PM to 3:00 PM - Shutters East I

Chair: *Xin Chen - Southwest Research Institute*
Authors:

High-Resolution Thickness Mapping With Neural Network and Ultrasonic Guided Waves, {QNDE2022-98221}
Abstract
Junkai Tong - Tianjin University
Min Lin - Department of Mechanical Engineering, University of Wyoming
Jian Li - State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University
Shili Chen - State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University
Yang Liu - State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University

Experimental Investigation of One-Way S0-A0 Lamb Wave Mixing Response for the Surface Corrosion Damage in Plates, {QNDE2022-98448}
Abstract
Xiangyan Ding - Hebei University of Technology
Ning Hu - State Key Laboratory of Reliability and Intelligence Electrical Equipment, and School of Mechanical Engineering, Hebei University of Technology
Mingxi Deng - College of Aerospace Engineering, Chongqing University
Youxuan Zhao - College of Aerospace Engineering, Chongqing University

A Deep-Learning Workflow for Weak Reflection Extraction in Pitch-Catch Measurements in Cased-Hole, {QNDE2022-98442}
Abstract

Qiang Wang - niversity of Electronic Science and Technology of China
Hua Wang - niversity of Electronic Science and Technology of China
Shaopeng Shi - niversity of Electronic Science and Technology of China

Guide Wave-Based Inspection of Adhesively Bonded Structures in Composite Plates, {QNDE2022-98228}
Abstract

Xiaoyan Zhang - Tianjin University
Yang Liu - Tianjin University

Full Waveform Inversion-Based Ultrasound Computed Tomography Acceleration Using 2d Convolutional Neural Networks, {QNDE2022-98523}
Technical Presentation Only

Christopher Kleman - University of Alabama
Shoaib Anwar - The University of Alabama
Zhengchun Liu - Argonne National Laboratory
Jiaze He - University of Alabama

08-01: NDE for Civil Infrastructure
7/26/2022
1:20 PM to 3:00 PM - Brickstones

Chair: *Sanchit Gupta - University of California San Diego*
Chair: *Tribikram Kundu - Univ Of Arizona*
Authors:

Non-Destructive Testing of Underwater Concrete Structures Using Remotely Controlled Drones, {QNDE2022-98134}
Abstract

Vishnu Venkatesh - Planys Technologies Pvt. Ltd.
Ashish Antony Jacob - Planys Technologies
Vineet Upadhayay - Planys Technologies
Prabhu Rajagopal - Indian Institute of Technology Madras
Krishnan Balasubramaniam - Indian Institute of Technology Madras
Tanuj Jhunjhunwala - Planys Technologies
Abhijeet Sangani - Planys Technologies
Sanchit Gupta - University of California San Diego

Measurement of Acoustoelastic Coefficients in Concrete Using Thermal Modulation of Ultrasonic Waves, {QNDE2022-96805}
Abstract

Bibo Zhong - University of Nebraska - Lincoln
Jinying Zhu - University of Nebraska–Lincoln

The Evaluation of the Adhesion Defects in Frcm Reinforcements for Masonry Constructions by Spc Non-Linear Acoustic Technique, {QNDE2022-97295}
Abstract

Anna Castellano - Department of Mechanics, Mathematics and Management, Polytechnic University of Bari
Aguinaldo Fraddosio - Department of Civil Engineering Sciences and Architecture Polytechnic University of Bari
Tribikram Kundu - Department of Civil and Architectural Engineering and Mechanics, University of Arizona

Single Lap Shear Tests on Frcm Strengthened Curved Masonry Pillars, {QNDE2022-98840}
Abstract

yu yuan - Politecnico di Milano
Ernesto Grande - Department of Sustainability Engineering, University Guglielmo Marconi
Mario Fagone - Dipartimento di Ingegneria Civile e Ambientale (DICEA), Università degli Studi di Firenze

Tommaso Rotunno - Dipartimento di Architettura (DiDA), Università degli Studi di Firenze
Gabriele Milani - Department of Architecture, Built Environment and Construction Engineering (ABC), Politecnico di Milano

Damage Identification for Large Scale Structures With Metaheuristic Algorithms – Review and Perspectives, {QNDE2022-98836}
Abstract
Anna Castellano - Politecnico di Bari - Dipartimento di Meccanica, Matematica e Management
Sadik Ozgur Degertekin - Dicle University
Luciano Lamberti - Politecnico di Bari - Dipartimento di Meccanica, Matematica e Management

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13-01: Nuclear Power NDE
7/26/2022
1:20 PM to 3:00 PM - Shutters East II

Chair: *Samuel Glass - PNNL*
Authors:

Frequency Domain Reflectometry to Detect Shielded and Unshielded Cable Moisture Exposure, {QNDE2022-96386}
Technical Paper Publication (Iran)
Samuel W. Glass - PNNL
Mychal P. Spencer - Pacific Northwest National Laboratory
A. Sriraman - Pacific Northwest National Laboratory
Leonard S. Fifield - Pacific Northwest National Laboratory
Matthew S. Prowant - Pacific Northwest National Laboratory

Ultrasonic Assessment of Concrete Aggregates Irradiated by Neutrons, {QNDE2022-97740}
Abstract
Hongbin Sun - Oak Ridge National Laboratory
Elena Tajuelo Rodriguez - Oak Ridge National Laboratory
Jose' Arregui Mena - Oak Ridge National Laboratory
Yann Le Pape - Oak Ridge National Laboratory
Thomas Rosseel - Oak Ridge National Laboratory

Targeted Eddy Current Inspection Based on Ultrasonic Feature Guided Wave Screening of Resistance Seam Welds, {QNDE2022-98365}
Abstract
Euan Foster - University of Strathclyde
Charles Macleod - University of Strathclyde
Ehsan Mohseni - University of Strathclyde
Charalampos Loukas - University of Strathclyde
Momchil Vasilev - University of Strathclyde
Shaun Mcknight - University of Strathclyde
Martin Mcinnes - University of Strathclyde
David Lines - University of Strathclyde
Anthony Gaghagan - University of Strathclyde
Gary Bolton - National Nuclear Laboratory LTD
Robert Bernard - Sellafield LTD

Magnetic Inspection Platform for Teleoperated Remote Inspections of Complex Geometry, {QNDE2022-98358}
Technical Presentation Only

William Jackson - University of Strathclyde
Dayi Zhang - University of Strathclyde
Ross Mcmillan - University of Strathclyde
Morteza Tabatabaeipour - University of Strathclyde
Rory Hampson - University of Strathclyde

Adam Gilmour - University of Strathclyde
Gordon Dobie - University of Strathclyde

Characterizing Microstructural Variability in Grade 91-92 Steels Using Coda Waves, {QNDE2022-98377}
Abstract
Subal Sharma - Michigan State University
Sunil Chakrapani - Michigan State University
Thiago Seuaciuc-Osorio - Electric Power Research Institute

01-01: Advanced Modelling for NDE & Ultrasonic Scattering
7/26/2022
3:30 PM to 5:30 PM - Brickstones

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

Theoretical Modelling of Ultrasonic Scattering From the Tips of Randomly Rough Defects, {QNDE2022-98526}
Technical Presentation Only
Fan Shi - Hong Kong University of Science and Technology

Focusing of an Ultrasonic Transducer Using a Functionally-Graded Structure, {QNDE2022-97147}
Abstract
Jillian Sollars - Air Force Research Laboratory
John Wertz - Air Force Research Laboratory
John Aldrin - Computational Tools

Modeling Friction Stir Welds in Civa, {QNDE2022-98507}
Abstract
Peter Juarez - NASA
Elizabeth Gregory - NASA

A Formal Approach for Verification and Validation for Simulations of Paut of Friction Stir Welds in Civa, {QNDE2022-98075}
Abstract
Elizabeth Gregory - NASA Langley Research Center
Peter Juarez - NASA Langley Research Center
Bill Schneck - NASA Langley Research Center

A Novel Displacement-Based Finite Element Formulation for Solid-Fluid Coupling Suitable for Gpu Calculations, {QNDE2022-98276}
Abstract
Yiannis Simillides - Imperial College London
Peter Huthwaite - Imperial College London
Michal Kalkowski - Institute of Sound and Vibration Research, University of Southampton
Michael Lowe - Imperial College London

05-05: Guided Waves V
7/26/2022
3:30 PM to 5:30 PM - Shutters West II

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

Non-Contact Mems-Array Inspection of Composites and Metallic Parts Using Lamb Waves, {QNDE2022-98043}
Technical Paper Publication (Iran)

Arno Volker - TNO
Egon Merks-Swolfs - TNO
Jan-Willem Vrolijk - TNO
Maurits Van Der Heiden - TNO
Quincy Martina - TNP

Development of a Linear Array Electromagnetic Acoustic Transducer for Shear Horizontal Guided Wave Inspection, {QNDE2022-98414}
Abstract
Aurelien THON - PULETS - Ecole de technologie superieure
Guillaume Painchaud-April - Evident Industrial
Alain Le Duff - Evident Industrial
Pierre Belanger - PULETS - Ecole de technologie superieure

Optimization of Bond Locations for Guided Waves Based Shm Using Coupled Optical Fibers, {QNDE2022-98188}
Abstract
Rohan Soman - Instit of Fluid Flow Machinery, Pasci
Jee Myung Kim - North Carolina State University
Sherif Aboubakr - North Carolina State University
Kara Peters - North Carolina State University
Wieslaw Ostachowicz - Insitute of Fluid Flow Machinery, PAN

12-03: Nonlinear Ultrasonics
7/26/2022
3:30 PM to 5:30 PM - Shutters West I

Chair: *Christopher Kube - The Pennsylvania State University*
Chair: *Kathryn Matlack - University of Illinois Urbana-Champaign*
Chair: *Laurence Jacobs - Georgia Tech*
Authors:

Nonlinear Waves in Layered Media, {QNDE2022-98237}
Abstract
Yoganandh Madhuranthakam - Michigan State University
Sunil Kishore Chakrapani - Michigan State University

Flaw Detection in Frp - Concrete Composite Using Nonlienar Ultrasonic Technique, {QNDE2022-98004}
Abstract
Saptarshi Sasmal - CSIR-Structural Engineering Research Centre
Sukanya Basu - Academy of Scientific and Innovative Research
Tribikram Kundu - Department of Civil & Architectural Engineering & Mechanics, The University of Arizona

Thermally Induced Acoustic Nonlinearity – Theory and Experiments, {QNDE2022-98593}
Abstract
Jinying Zhu - University of Nebraska-Lincoln
Bibo Zhong - University of Nebraska-Lincoln

10-02: NDE/SHM for Oil & Gas Industry
7/26/2022
3:30 PM to 5:30 PM - Shutters East I

Chair: *Xin Chen - Southwest Research Institute*
Authors:

Comparison of Response Characteristics of Monopole Acoustic Logging With Poorly Bonded Interface in a Double-Casing Well, {QNDE2022-98333}
Abstract

Pan Jinlin - China University of Petroleum
Chen Xuelian - China University of Petroleum
Tang Xiaoming - China University of Petroleum

Corrosion Detection in Storage Tank Bottoms via Omni-Directional Magnetostrictive Guided Wave Inspection System, {QNDE2022-98728}
Abstract

Xin Chen - Southwest Research Institute
Adam Cobb - Southwest Research Institute
Sergey Vinogradov - southwest research institute

Response Characteristics of Multipole Sonic Log in Double Casing Strings, {QNDE2022-98485}
Abstract

Bo Rao - China University of Petroleum （East China）
Yuanda Su - China University of Petroleum （East China）
Shengqing Li - China University of Petroleum （East China）
Xiaoming Tang - China University of Petroleum （East China）

Long-Distance Monitoring of Buried Pipes Using Hybrid Mode T(0,1) Wave Piezoelectric Ring Transducers, {QNDE2022-98212}
Technical Presentation Only

Faxin Li - Peking University
Hongchen Miao - Southwest Jiaotong University
Qiang Huan - Peking University
Mingtong Chen - Peking University

Towards Robust Multi-Casing Evaluation With Pulsed Eddy Current Sensors, {QNDE2022-98403}
Abstract

Saad Omar - Schlumberger-Doll Research Center

15-02: Structural Health Monitoring
7/26/2022
3:30 PM to 5:30 PM - Shutters East II

Chair: *Wiesław Ostachowicz - Polish Academy of Sciences*
Chair: *Henrique Reis - University of Illinois*
Authors:

Analysis of Unsupervised Local Pca Reconstruction for Long-Term Damage Detection in Uncontrolled Guided Wave Structural Health Monitoring Environments, {QNDE2022-98180}
Abstract

KANG YANG - University of Florida
Sungwon Kim - University of Utah
Joel B. Harley - University of Florida
Cody Laflamme - University of Florida

A Generic Numerical Solver for Modeling the Influence of Stress Conditions on Guided Wave Propagation for SHM Applications., {QNDE2022-98682}
Abstract

André Dalmora - Université Paris-Saclay, CEA, List
Alexandre Imperiale - Université Paris-Saclay, CEA, List
Sébastien Imperiale - Project-Team MΞDISIM, Inria Saclay-Ile-de-France
Philippe Moireau - Project-Team MΞDISIM, Inria Saclay-Ile-de-France

Application of Temperature Compensation Strategies for Ultrasonic Guided Waves to Distributed Sensor Networks, {QNDE2022-98534}
Abstract

Vittorio Memmolo - University of Naples FEDERICO II
Yevgeniya Lugovtsova - BAM
Massimiliano Olino - University of Naples Federico II
Jens Prager - BAM

Ground Faults in Photovoltaics: Sstdr for Characterization, Detection, and Location, {QNDE2022-98549}
Abstract
Cody Laflamme - University of Florida
Cynthia Furse - University of Utah
Joel B. Harley - University of Florida

WEDNESDAY, JULY 27, 2022

01-02: Advanced Modelling for NDE
7/27/2022
10:20 AM to 12:00 PM - Brickstones

Chair: *Andrea Arguelles - Penn State University*
Chair: *Wiesław Ostachowicz - Polish Academy of Sciences*
Authors:

Nondestructive Assessment of Vibration Failures for Engine Exhaust Silencer, {QNDE2022-98561}
Abstract
Agron Gjinolli - Durr Universal Inc.
Paul Liang - Durr Universal Inc.

10-03: NDE/SHM for Oil & Gas Industry
7/27/2022
10:20 AM to 12:00 PM - Shutters East I

Chair: *Xin Chen - Southwest Research Institute*
Authors:

Compressive Sensing and Deep Learning Enhanced Imaging Algorithm for Sparse Guided Wave Array, {QNDE2022-98335}
Abstract
Xiaocen Wang - Tianjin University
Min Lin - Department of Mechanical Engineering, University of Wyoming
Jian Li - Tianjin University
Dingpeng Wang - Tianjin University
Yang Liu - Tianjin University

Full View Visual Inspections for Small Bore Pipes Using a Commercial Videoscope, {QNDE2022-98314}
Technical Presentation Only
Dayi Zhang - University of Strathclyde
William Jackson - University of Strathclyde
Gordon Dobie - University of Strathclyde
Graeme West - University of Strathclyde
Charles Macleod - University of Strathclyde

Quantitative Evaluation Method of Tightening Status of Bolted Joints Based on Acoustic Emission, {QNDE2022-98811}
Abstract
Xiaoran Wang - Beijing University of Technology
Zenghua Liu - Beijing University of Technology
Jiuzhou Tian - Beijing University of Technology

Structures Inversion and Optimization in Cased-Wells Based on Deep Learning, {QNDE2022-98591}
Abstract

Siqi Zhang - Tianjin University
Xiaocen Wang - Tianjin University
Zhoumo Zeng - Tianjin University
Yang Liu - Tianjin University

02-01: Metamaterials and Thermal Techniques for NDE
7/27/2022
10:20 AM to 12:00 PM - Shutters West II

Chair: *Jeong-Beom (JB) Ihn - Boeing*
Chair: *Yuris Dzenis - UNIVERSITY of NEBRASKA–LINCOLN*
Authors:

A Study on the Influence of Wave Scattering in Metamaterial Based Super Resolution Imaging of Defects in Materials, {QNDE2022-98345}
Abstract
LOHESHWARAN CHANDRAN - IIT- MADRAS
Mohamed Subair Syed Akbar Ali - Indian Institute of Technology Madras
Abhishek Saini - Nanyang Technological University, Singapore
Zheng Fan - Nanyang Technological University, Singapore
Prabu Rajagopal - Indian Institute of Technology Madras

Mode Filtering of Guided Elastic Waves in a Hollow Pipe Using a Meta-Surface, {QNDE2022-98311}
Technical Presentation Only
Lalith Sai Srinivas Pillarisetti - The Pennsylvania State University
Cliff J Lissenden - The Pennsylvania State University
Parisa Shokouhi - The Pennsylvania State University

On the Limits of Defect Detection and Characterization in Thermal Nde Methods, {QNDE2022-98662}
Abstract
Omar Obeidat - Wayne State University
Qiuye Yu - Wayne State University
Xiaoyan Han - Wayne State University

Physics-Based Sonic Ir Crack Length Estimation Using Thermal Images Alone, {QNDE2022-98191}
Abstract
Bassam Abu-Nabah - American University of Sharjah
Samer Al-Said - Jordan University of Science and Technology

03-01: Digital Thread/Digital Twin/Big Data
7/27/2022
10:20 AM to 12:00 PM - Shutters West I

Chair: *Stephen D Holland - Iowa State University*
Authors:

Flexible Robotics to Inspect High-Value Components, {QNDE2022-94519}
Abstract
Randika Kosala Wathavana Vithanage - University of Strathclyde
Kenneth Burnham - National Manufacturing Institute Scotland
Momchil Vasilev - University of Strathclyde
Charalampos Loukas - University of Strathclyde
Harry Gover - University of Strathclyde
Ehsan Mohseni - University of Strathclyde
Rastislav Zimmermann - University of Strathclyde
David Lines - University of Strathclyde

Yashar Javadi - University of Strathclyde
Charles Macleod - University of Strathclyde
Stephen Gareth Pierce - University of Strathclyde
Anthony Gachagan - University of Strathclyde
Stewart Williams - University of Cranfield
Jialou Ding - University of Cranfield

Dataguzzler-Python and Spatialnde2: Critical Infrastructure for Placing Nde Data in Spatial Context, {QNDE2022-98590}
Technical Presentation Only
Stephen D Holland - Iowa State University
Tyler Lesthaeghe - University of Dayton Research Institute

A Proposed Common File Format for Nde Data, {QNDE2022-98592}
Technical Presentation Only
Stephen D Holland - Iowa State University
David Forsyth - Texas Research Institute (TRI) Austin, Inc.

13-02: Nuclear Power NDE
7/27/2022
10:20 AM to 12:00 PM - Shutters East II

Chair: *Samuel Glass - PNNL*
Authors:

Development of an Ultrasonic Measurement System for High-Temperature Discontinuous Crack Sizing, {QNDE2022-98515}
Abstract
Edmund Jones - Imperial College London
Joseph Corcoran - University of Cincinnati

Robotized Adaptive Technique for the Inspection of a Complex Component With a Matrix Array, {QNDE2022-98536}
Abstract
David Roue - CEA
Ekaterina Iakovleva - CEA
Francois Cartier - CEA-List

Manon Chastaing - EDF DIRECTION INDUSTRIELLE
Etienne Martin - EDF DIRECTION INDUSTRIELLE
Frederic Reverdy - Eddyfi technologies

Fuel Rod Characterization Using Laser Ultrasonics, {QNDE2022-98575}
Abstract
Bradley Bobbs - Intelligent Optical Systems, Inc.
Marvin Klein - Intelligent Optical Systems
Peter Nagy - University of Cincinnati
John Beale - Electric Power Research Institute
Byungsik Yoon - Electric Power Research Institute

PRESENTING AUTHOR INDEX

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