

FDM2026

Conference Programme

Conference Venue: NH PLAZA DE ARMAS
Avda. Marqués de Parada S/N, 41001 Sevilla, SPAIN

Early Registration Sunday 20th from 17.00-18.00

Instructions to Speakers and Session Chairs

To ensure the smooth running of the conference programme, we kindly ask all speakers and session chairs to observe the following arrangements.

Presentation Timing

Each presentation is allocated a total of 20 minutes, comprising:

- 15 minutes for the presentation
- 5 minutes for questions and discussion (Q&A)

The conference programme is very tight. We therefore ask all speakers and session chairs to strictly adhere to the allocated 20-minute time slot. Session chairs are requested to ensure that presentations and Q&A sessions finish on time so that subsequent sessions are not delayed.

Before Your Presentation

Speakers are kindly requested to:

- Introduce themselves to their Session Chair before the start of the session.
- Upload their presentation to the designated folder on the conference laptop before their scheduled talk, preferably before the session begins.
- Wherever possible, use the conference laptop for their presentation. This will avoid delays associated with changing laptops and connecting different computers between presentations.

Conference Laptops

A laptop will be provided in each session room. The laptops will have Microsoft Office software installed, including Microsoft PowerPoint, and will be ready for presentations.

Day 1: 21st September

08:15	Registration
08:45	Opening Remarks: Ferri Aliabadi and Luis Rodríguez-Tembleque
Plenary Session Chair: Ferri Aliabadi	
09:00	Keynote lecture: The Fatigue Challenge in Metal Additive Manufacturing ; Jaime Domínguez Professor Emérito, ETSI, Universidad de Sevilla

Session A1: TORNEO	
Chair: A Nobari	
09:30	Effect of TiB₂ Content and PBF-LB Process Parameters on the Microstructure and Mechanical Properties of IN939 Metal Matrix Composites <u>Tomáš Slezák</u> , Ivo Šulák, Martin Malý, Michal Křištof, Daniel Koutný, Karel Dvořák
09:50	Fibre-Efficient Design of 3D-Printed Continuous Fibre Reinforced Structures <u>Andrea Sellitto</u> and Aniello Riccio
10:10	Oxide Layer Investigations on AISI 347 and ER 347 <u>Nina Grözinger</u> , Georg Veile, Qiang Wang, Stefan Weihe

Session B1: EXPO	
Chair: Yanhong Chen	
09:30	Self-Engaging Honeycomb-Inspired Metamaterials with Contact-Driven Stiffness Adaptation <u>Chetna Srivastava</u> , Tejas Iyer, Bert Sluys, <u>Mohammad Fotouhi</u>
09:50	An Adaptive Length-Scale Cohesive Zone Model for Alleviating Mesh Size Effects in Delamination Analysis <u>P. Olivares-Rodríguez</u> , J. Reinoso, A. Valverde-González
10:10	Small-Scale Domain Switching near Sharp Piezoelectric Bi-Material Notches Between Piezoelectric Layer and Elastic Conductor <u>Miroslav Hrstka</u> , <u>Michal Kotoul</u> and Tomáš Profant

10:30 Coffee Break

Session A2: TORNEO	
Chair: V Mallardo	
11:00	Electrochemical Failure Analysis of Chloride-Induced Localized Damage in Stainless Steels Surya Prakash Gajagounia, Imad Barsoum, <u>Akram Alfantazi</u>
11:20	Investigation of the Effect of Strain Rate on Crack Propagation under Hydrogen Charging System <u>Luca Gritti</u> , Lorenzo Nani, Sergio Lorenzi, Lidia Martínez, Virginia Madina Arrese, Jonathan Duff, Fabio Scenini, Marina Cabrini
11:40	Scaling Dispersion Analysis of Ultra-Thick Viscoelastic Laminates via Inter-Manifold Transport <u>Xiao Dong</u> , Zahra Sharif Khodaei, M. H. Ferri Aliabadi
12:00	Challenges Due to Hydrogen Entrapment in the Steelmaking Industry <u>Roberto Elvira</u> , Lore Loizola, Jacinto Albarrán
12:20	Modelling Degradation of Materials in Space Applications: the HySpaceCoDe Platform Project <u>Aurélien Sibo Yuan</u> , Fadi Aldakheel, <u>Ivano Benedetti</u>

Session B2: EXPO	
Chair: Miroslav Hrstka	

Session B2: EXPO	
11:00	Numerical Investigation of Bone Microstructure using μCT Image Processing and Finite Element Modeling <u>Rishav</u> , <u>Romana Piat</u>
11:20	A SCA-DNN multiscale model for 3D woven composites based on the damage evolution genome database <u>Siyang Wu</u> , <u>Licheng Guo</u>
11:40	Uncertainty Quantification for Structural Integrity Assessments using Surrogate Modelling <u>Jalal Abdolahi</u> , Sina Safari, David Knowles, Paul Wilcox, Mahmoud Mostafavi
12:00	YOLO-Based Feature Extraction for Linking Local Weld Geometry and Fracture Surface Data to Fatigue Performance <u>Martin Melucci</u> , Sulaiman Shojai, Mahamudul Hasan Tanvir, Moritz Braun
12:20	Optimizing Risk-Based Inspection using Structural Health Monitoring (SHM)-Informed Structural Reliability Analysis <u>S. Suankem</u> , A. Kongchang, C. Jiraporncharoensuk, N. Panthong, N. Ruamchomrat, K. Kulkraisri, S. Uiyyasathian, S. Katanyoowongcharoen

13:00 Lunch

Session A3: TORNEO	
Chair: Emanuele Vincenzo Arcieri & Ziwen Xu	
14:00	Flexural Damage and Failure Modelling of Mono-Fibre and Intraply Hybrid Sisal-Flax Bio-Composites <u>Jobin Joy</u> , Duncan Camilleri, Brian Ellul Grech, Martin Muscat, Claire Muscat-Fenech, Daniel K. K. Cavalcanti, Tehseen Ullah, Zhenyu Wu
14:20	Exploiting Matrix Compliance to Modify Fibre Rotation in Angle-ply Composites: a Numerical Study with Manufacturing Perspectives <u>Tejas Iyer</u> , Chetna Srivastava, Bert Sluys, Kunal Masania, Mohammad Fotouhi
14:40	Effects of Loading Speed and Fiber Content on Flexural Property of Short-Fiber Reinforced Green Composites using Agricultural Material and Biopolymer <u>H. Katogi</u>
15:00	Design of Local Reinforcement at the Tooth Root in CFRP Gears for Enhanced Bending Strength <u>S. Mitsubayashi</u> and <u>K. Takemura</u>
15:20	Tailoring Damage Mechanism and Fracture Toughness using Interlocking Interface Prince Shukla, V. Balram, and <u>Sandip Halder</u>
15:40	Role of Fiber Volume Fraction Gradient in Cure-Induced Deformations and Residual Stresses of Curved CFRP Laminates <u>Yanhong Chen</u> (Invited)
16:00	A Phase Field Model for Fatigue in Metals <u>Jiménez-Alfaro</u> , <u>Sara</u> , Martinez-Pañeda
16:20	Coupled Phase Field-Cohesive Zone Model for 3-D Long Fibre Reinforced Composites. <u>A. Valverde-González</u> , P. Olivares-Rodríguez, J. Reinoso

Session B3: EXPO	
Chair: I Benedetti & Kai HUANG	
14:00	A Unified Beam Theory for Characterizing the Deformation and Fracture Behaviour of Asymmetric Double Cantilever Beams <u>Ziwen Xu</u> (Invited)
14:20	Geodesic-Based Prediction of Crack Propagation in Triply Periodic Minimal Surface Lattices <u>Thi Ngoc Diep Tran</u> , Ahmed Hamdy Abdelgawad, <u>Imad Barsoum</u> , <u>Romana Piat</u>
14:40	Mixed Mode Crack Growth and Fatigue Life of Wood under Hygro-Mechanical Loading <u>Loïc Chrislin Nguedjio</u> , Rostand MOUTOU PITT, Benoit BLAYSAT, Alaa CHATEAUNEUF, Frédéric DUBOIS, Nicolas SAUVAT, Naman RECHO

Session B3: EXPO	
15:00	Experimental Characterization of Fatigue Damage and Failure in Plain-Woven Composite Bolted Joints in Thermal Environments <u>Liu, Xiaodong</u>
15:20	Fundamental Study on High-Precision Stress Concentration Prediction for Multiple Interacting Defects using Deep Learning Based on the Body Force Method <u>Takuichiro Ino, Yohei Sonobe, Shinichi Kubota, Atsuhiko Koyama and Akihide Saimoto</u>
15:40	Inter-Turbine Spacing Effects on Wake-Induced Blade Dynamics <u>Francisco Jose Gomes de Oliveira, Zahra Sharif Khodaei, Oliver Buxton</u>
16:00	Nonlinear Virtual Element Method for Shallow Shells <u>Luke Wyatt, Zahra Sharif Khodaei, M. H. Ferri Aliabadi</u>

Poster session: 14:00-15:00

- **Damage Mechanics and Structural Integrity of DED-Manufactured Stainless-Steel Supports for HTS Coils in the SMART Tokamak**
- J. Campos-Garcia, J. Gonzalez-Martin, D. Erena, Carlos Navarro, Jesús Vázquez, M. Garcia-Muñoz, J. Lucas, I. Heras, M. Escudero, F. Puentes Del Pozo, A. Rodriguez-Gonzalez, A. Sanz, J. Martínez
- **Fast estimation of texture-dependent piezoelectric figures of merit for guided-wave structural health monitoring**
Julieta L. Buroni, Federico C. Buroni
- **Adsorbed film of bovine serum albumin role in resisting brittle fracture of a lean magnesium alloy**, Solomon Ansah, Mahmoud Mostafavi, Robin E. Schäublin, Jörg F. Löffler, M.J.N.V. Prasad, Raman Singh

19:00 Welcome Reception (Drinks and small bites)

see the last page

Day 2: 22nd September

Session A4: TORNEO	
Chair: Imad Barsoum	
09:00	Multi-Probe Direct Current Potential Drop for In-Situ Characterization of Fatigue Crack Location and Geometry <u>Luca Vecchiato, Riccardo Dal Molin, Alberto Campagnolo, Jürgen Bär and Giovanni Meneghetti</u>
09:20	Experimental Verification of the Model of Fatigue Crack Growth in Porous Filaments of Titanium Lattices for Orthopaedic Implants <u>Pavel Šandera, Jana Escherová, Marta Kianicová, Karel Slámečka, Jana Horníková, Jaroslav Pokluda</u>
09:40	Reliability Analysis Methods for Probabilistic Damage Tolerance: A Review and Down-Selection Framework <u>Mengke Zhuang, Nicolas O. Larrosa, Julian D. Booker, Christopher E. Truman</u>
10:00	Effects of Transition Zone Geometry on the Design and Compressive Failure of Brittle Hybrid TPMS Structures <u>Thi Ngoc Diep Tran and Romana Piat</u>

Session A4: TORNEO	
10:20	Fatigue and Damage Tolerance Design and Simulation for Aerospace Structures: Safe-Life and Damage-Tolerant Certification Approaches <u>Hayder Y Ahmad</u> , Mark Craig

Session B4: EXPO	
Chair: Marie Kvapilova	
09:00	The Effect of Thermal Treatment on the Creep of Zircaloy-4 Alloy Claddings <u>M. Kvapilova</u> , P. Kral, J. Dvorak, V. Boucek, J. Krejci, <u>V. Sklenicka</u>
09:20	Nonlinear Modeling of Porous/non-Porous Media for Sustainable Applications <u>Valentina A. Salomoni</u> , Gianluca Mazzucco, Giovanna Xotta, Riccardo Fincato, Beatrice Pomaro, Nico De Marchi
09:40	Computational Micromechanics for Lead-Free Piezocomposites: Linking Microstructural Features, Matrix Tailoring, and Degradation Mechanisms to Functional Performance <u>Francisco J. Cañamero</u> , <u>Luis Rodríguez-Tembleque</u> and Federico C. Buroni
10:00	Degradation Processes in Thermal Creep of Zr1%Nb Alloy Cladding <u>V. Sklenicka</u> , <u>M. Kvapilova</u> , P. Kral, J. Dvorak, J. Krejci
10:20	Damage Influence of Piezoelectric Actuators for Haptic Applications Amalia Prieto-Sánchez, María J. Seva, Iván Ubero, María S. Commisso, <u>Luis Rodríguez-Tembleque</u> , Federico C. Buroni

10:40 Coffee Break

Session A5: TORNEO	
Chair: Licheng Guo	
11:00	A Baseline-Free Method for In-Service Crack Detection under Complex Loading Conditions <u>Yuhang Pan</u> , Zahra Sharif Khodaei, M. H. Ferri Aliabadi
11:20	Predictive Meso-Mechanics Modelling of Components under Creep/Fatigue Cracking and Fracture Loading; <u>Kamran Nikbin</u> (Keynote)
11:40	Ultrasonic Velocity Measurements in Strongly Orthotropic Wood for Timber Structure Monitoring <u>Valentine Remond</u> , Eric ROSENKRANTZ, LAMY Frédéric, AUGEREAU Franck, LAUX Didier, TOULGOAT Killian, FERRANDIS Jean-Yves, DUBOIS Frédéric
12:00	On-Device Tilt and Symmetry Sensing with a MEMS Accelerometer: an Integration-Free Embedded Approach <u>Aliakbar Ghaderiaram</u> , Erik Schlangen, Mohammad Fotouhi
12:20	Bayesian Model Selection for Automated Identification of Cable Tension Forces from Vibration Data <u>Abouzar Jafari</u> , Antonio S. López-Cuervo, and Enrique García-Macías
12:40	Baseline-Free Methods for Damage Identification on Honeycomb Panels <u>Haomiao Fang</u> , Zahra Sharif Khodaei, M. H. Ferri Aliabadi

Session B5: EXPO	
Chair: Li Zhang	
11:00	High-Cycle Fatigue Characterization via High-Throughput Experimentation <u>Bilal, Ahmed</u>
11:20	Experimental Characterization of Impact Damage and Resulting Fatigue Performance in Lightweight Components <u>Emanuele Vincenzo Arcieri</u> and <u>Sergio Baragetti</u>
11:40	Fatigue Properties of Anodized Aluminum Alloys Ashley Kobylinski, Kade Cochran, Sarah Leka, Joey Slaybaugh, Jack Manion, <u>Omar S. Es-Said</u> , Mike Hahn, Mark Timko, Mike O'Brien, Xiaodong Sun, Tim Breman, Yong-Jun Li, Mustafa Mozael
12:00	Three-Dimensional Analysis of Historical Masonry Structures on Elastic Soil <u>Vincenzo Mallardo</u> , Nicola Grillanda

Session B5: EXPO	
12:20	Collapse Pressure and Structural Response Prediction for Helical Steam Generator Tubes under External Pressure <u>Hyeon-Su You</u> , Yong Gyun Shin, and <u>Yoon-Suk Chang</u>
12:40	Transport-Induced Damage Due to Stress Concentration from High Stiffness Gradients in Thin-Walled Power Transformer Structures <u>Piero Morelli</u>

13:00 Lunch

Session A6: TORNEO	
Special Session on Structural Integrity and Crashworthiness of Hydrogen Storage Systems Chair: <u>A. De Luca & Donato Perfetto</u>	
14:00	Crashworthiness Behavior of a Curved Shell Component Impacting Re-Entrant Auxetic Lattice Structures <u>A. De Luca</u> , G. Taddeo, <u>M. Avallone</u> , F. Caputo, C. Palumbo, A. Chiariello, M. Belardo
14:20	How to Assess the Crash Response of a CS-25 Hybrid Aircraft Equipped with a Liquid-Hydrogen Tank: A Preliminary FEM Test-Matrix Approach for Certification Support <u>Mariacristina Nardone</u> , Mario Graziano, Claudio Pezzella, Panagiotis Koronaos, Francesco Caputo, Antonio Negro
14:40	Autotomic Aircraft for Crash-Safe Cryogenic Tank Separation <u>R. S. Donelli</u> , C. Pezzella, S. Adden, J. Beretta, P. Lampitella, J. Kaczkowski
15:00	Explicit Dynamic Analysis of Energy Absorption Mechanisms in Re-Entrant Auxetic Lattice Cells for Crashworthiness Applications <u>C. Palumbo</u> , G. Taddeo, M. Avallone, A. De Luca, A. Chiariello, M. Belardo, F. Caputo
15:20	Break
15:30	A Building-Block Acoustic Emission Framework for Transferable Damage Characterisation of Composite Pressure Vessels <u>Zahra Sharif Khodaei</u> , Ali Nokhbatolfoghahai, Yuhang Pan, Aparna Mahadevan, Tristan Chabanel, Camilla Osmiani, Alex Doyle, M. H. Ferri Aliabadi
15:50	Experimental Assessment of Guided-Wave Damage Sensitivity in a Full-Scale Thermoplastic Composite Aerostructure <u>Donato Perfetto</u> , Luciano Pianese, Antonio Polverino, Antonio Aversano, Giuseppe Lamanna, Alessandro De Luca, Francesco Caputo
16:10	Evaluation of Structural Health Monitoring Concepts for Vacuum-Insulated Liquid Hydrogen Cryotanks: an Aviation Certification Perspective <u>Mirko Simonetto</u> , John-Alan Pascoe, <u>Nan Yue</u>
16:30	CARBON/EPOXY MATERIAL CHANGES AFTER LONG-TERM CRYOGENIC EXPOSURE: FROM MICROSTRUCTURE TO THERMO-MECHANICAL PROPERTIES <u>Serafín Sánchez-Carmona</u> , Carmen Pino-Pueyo, Elena Correa Montoto, Federico París

Session B6: EXPO	
Chair: <u>Wouter De Corte & Akihide Saimoto</u>	
14:00	Enriched Logarithmic Singular Element for Mode I and Mode II Cracks in Spring Interfaces: from MATLAB to Abaqus <u>María A. Herrera-Garrido</u> , Luis Távara, Mar Muñoz-Reja, Alberto Vázquez-Sánchez, Vladislav Mantič
14:20	A Voronoi Boundary Integral Model for Brittle Polycrystalline Micro-Cracking under Weakly-Coupled Thermo-Mechanical Loads <u>Alessandra Tumbiolo</u> , Dario Campagna, Alberto Milazzo, <u>Ivano Benedetti</u>
14:40	Stress Intensity Factor of an Edge Crack in an Anisotropic Half Plate Subjected to a Self-Balancing Concentrated Loads at Crack Faces Yuichirou Ambe, Atsuhiko Koyama, <u>Akihide Saimoto</u>

Session B6: EXPO	
15:00	Two-Scale Modelling of Elastic Properties and Compressive Failure in Lightweight Self-Compacting Concrete <u>Faraz Golkarian</u> , Jan Richter, Pascal Alexander Happ, Eva Hamelmann, Albrecht Gilka-Bötzow and <u>Romana Piat</u>
15:20	Break
15:30	Mode-I Thermal Stress Intensity Factors of a Three-Dimensional Surface Crack Perpendicular to the Free Surface under an Instantaneous Internal Point Heating Shinichi Kubota, <u>Yohei Sonobe</u> , <u>Takuichiro Ino</u> , Atsuhiko Koyama and <u>Akihide Saimoto</u>
15:50	Study on Intelligent Automated Production Techniques for Manufacturing Equipment Considering Fiber Damage Defects Taemin Han, Haseung Lee, Ilhak Ban, <u>Hyunbum Park</u>
16:10	Structural Damage Identification in a Cantilever Beam using an L-Curve Regulated Optimization Algorithm and Low-Cost Instrumentation Miguel Carrion Colchero, Javier Naranjo-Pérez, Andrés Sáez, <u>Javier Fernando Jiménez-Alonso</u>
16:30	Physics-Informed Neural Network for Wave Field Reconstruction <u>Guangxiao Zou</u> , Zahra Sharif Khodaei

Poster Session 14:00-15:00

- **Towards a Multiscale Phase-Field Framework for Composite Fracture Analysis**
Cheryl Hao, Haolin Li, Zahra Sharif Khodaei, M. H. Ferri Aliabadi
- **Structural Health Monitoring for Fibre Metal Laminates: Glass Reinforced Laminates (GLARE)**
Promkuntong, Tul, Zahra Sharif Khodaei, M. H. Ferri Aliabadi
- **How to design a retention system for an existing aircraft that is being hybridized, while still meeting crashworthiness requirements through limited modifications, retention devices, and energy-absorbing solutions**
Mariacristina Nardone
- **Inverse Identification of CFRP Interface Properties using a PMTE-SC-Based Coupled Criterion**
J.L. Guzmán, M. Muñoz-Reja, L. Távara, V. Mantič
- **Multi-Site Fiber-matrix Debonding Prediction using the Principle of Minimum Total Energy Subjected to a Stress Condition**
J.M. Pimentel, V. Mantič, M. Muñoz-Reja, L. Távara

20:30 Conference Banquet: Rio Grande Restaurant
(see the last page)

Day 3: 23rd September

Session A7: TORNEO: Keynote Session

Chair: Romana Piat

09:00	Nonlinear Dynamic Response Characteristics Induced by Debonding in Layered Structures Shabnam Kiasat, <u>Ali S. Nobari</u> (Keynote)
09:20	AI and Mechanics-Driven Concurrent Multiscale Damage Model for 3D Woven Composites <u>Licheng Guo</u> (Keynote)
09:40	Protein in Physiological Fluid Resists Premature Fracture of a Magnesium Alloy: Unique, Remarkable and Contrasting Influences on Stress Corrosion Cracking and Corrosion <u>Singh, Raman</u> (Keynote)
10:00	Modeling Cracks at Spring Interfaces Using Enriched Singular Elements with Combined Logarithmic and Square-Root Singularities Álvaro Arellano, Julio Arroyo, María A. Herrera-Garrido, Sara Jiménez-Alfaro, Luis Távara, Mar Muñoz-Reja, <u>Vladislav Mantić</u> (Keynote)
10:20	Stochastic Fatigue Life Prediction of High-Density Polyethylene Offshore Installations under Irregular Sea Loading Md. Mamun R. Patwary, <u>Igor Tsukrov</u> , Longhuan Zhu, Zachary Davonski, Michael Chambers and David W. Fredriksson (Keynote)
10:40	Coffee Break

Session A8: TORNEO

Chair: Zahra Sharif Khodaei

11:00	A MICROSTRUCTURAL APPROACH TO THE COMPUTATIONAL MODELLING OF CORROSION IN MAGNESIUM ALLOYS Fatemeh Karamifard, Ted J. Vaughan and <u>Peter E. McHugh</u>
11:20	An AE Damage Identification Method for Woven Composites by Modal Energy Analysis <u>Kai Huang</u> (Invited)
11:40	A Nonlinear Dynamic FFT-Based Solver for Damage and Phase-Field Fracture Analysis of Heterogeneous Materials <u>Menglei Li</u> , Bing Wang, Javier Segurado
12:00	Integrated Fatigue Design of Welded Structures: A Lifecycle-Oriented Approach Combining Fracture Mechanics, Loading, and Manufacturing <u>Per-Olof Danielsson</u> , <u>Magnus Andersson</u> , Martin Kroon
12:20	Optimizing Scanning Strategies to Mitigate Residual Stresses in LPBF-Manufactured Lattice Structures <u>Ahmed Abdelgawad</u> , Imad Barsoum, Rashid K. Abu Al-Rub
12:40	Unified Generative Design of Architected Metamaterials Enabled by Diffusion Models <u>Haolin Li</u> , Zahra Sharif Khodaei, M. H. Ferri Aliabadi

13.00 Lunch

End of Conference

Monday 21st September

19:00--> Welcome Reception: Guadalquivir River Cruise

Location: Cruceros Torre del Oro, P.º Alcalde Marqués del Contadero, s/n, 41001 Sevilla

<https://maps.app.goo.gl/Zrrj14vCRUdEZBJC9>



Tuesday 22nd September

20:30--> Conference Banquet: Rio Grande Restaurant

Location: Calle Betis, 69, 41010 (Sevilla)

<https://maps.app.goo.gl/Vfi3GDBxbcWHJex48>

<https://glhrestaurants.com/c/restaurantes/rio-grande/>

