



MS2024

2ND INTERNATIONAL CONFERENCE ON MECHANICS OF SOLIDS

FEUP, Porto - Portugal

30-31 October 2024

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PROGRAMME

PROGRAMME OF MS 2024

Author underlined → presenting author

* Keynote lecture

Wednesday 30 October 2024

8:40 **MS 2024 Opening (Room B032)**

Room B032

9:00* Higher-order strong and weak formulations for arbitrarily-shaped shell structures of advanced anisotropic materials in multifield analysis (**MS24_47**)

F Tornabene (University of Salento, Italy)

Session 1 – Elasticity, viscoelasticity and plasticity

(Chair: AM Ferreira and PNB Reis)

Room B032

9:40 A study on linear viscoelastic periodic problems through computational homogenization (**MS24_12**)

SC Calvimontes, R Rodriguez-Ramos (UFF, Rio de Janeiro, Brazil), P Rodriguez-Bermúdez, JA Rodriguez-Durán, Y Espinosa-Almeyda, JA Otero, FJ Sabina

10:00 Simplification of the Carrera unified formulation for isotropic plates (**MS24_30**)

AJM Ferreira (University of Porto, Portugal)

10:20-11:00 **COFFEE BREAK (Room under the Auditorium)**

Session 2 – Mechanical behaviour of materials

(Chair: LFM da Silva and RJC Carbas)

Room B002

11:20 Complete solutions in the linear theory of materials with voids (**MS24_51**)

S De Cicco (University of Naples "Federico II", Italy)

11:40 Development of a unified specimen for direct generation of cohesive zone law data of adhesives (**MS24_6**)

DS Correia (INEGI, Portugal), EAS Marques, RJC Carbas, LFM da Silva

12:00 Fracture energy of a polyurethane adhesive in vehicle body applications: Investigating the interaction of strain rate, loading mode, and temperature (**MS24_46**)

M Ribas (INEGI, Portugal), A Akhavan-Safar, RJC Carbas, EAS Marques, S Wenig, LFM da Silva

12:20 Experiments and comprehensive comparison of polycarbonate material models for impact and drop test simulations (**MS24_15**)

Q Panina (Corning SAS Finland Branch, Finland), S Beeman, M Segar

12:40 Physical and numerical investigation of hot plastic flow in medium-Mn steel for automotive forgings (**MS24_52**)

A Kozłowska, S Sławski, W Borek, A Grajcar (Silesian University of Technology, Poland)

13:00-14:00 **LUNCH BREAK (Room under the Auditorium)**

Room B032

14:00* Analysis of fracture in joints of bimaterial specimens with strip geometry (**MS24_21**)

F Mujika (University of the Basque Country, Spain)

Session 3 – Fracture mechanics and Fatigue

(F Mujika and A Akhavan-Safar)

Room B002

14:40 Factors influencing fatigue behavior of similar and dissimilar adhesive joints (**MS24_8**)

FC Sousa, A Akhavan-Safar (INEGI, Portugal), RJC Carbas, EAS Marques, R Goyal, J Jennings, LFM da Silva

15:00	A new methodology to determine the flexural modulus based on an asymmetric double cantilever bending test (MS24_14) <u>F Mujika</u> (University of the Basque Country, Spain), J de Gracia, U Garitaonandia, N Insausti	
15:20	Analysis of fatigue crack propagation using peridynamics (MS24_31) <u>EB Paulo</u> (University of Lisbon, Portugal), FS Vieira, AL Araujo	
15:40	J-integral vs. CBBM in mode I fracture analysis of adhesive joints (MS24_9) <u>B Reket</u> (INEGI, Portugal), M Ferreira, M Ribas, B Simoes, A Akhavan-Safar, RJC Carbas, EAS Marques, LFM da Silva	
16:00-16:20	COFFEE BREAK (Room under the Auditorium)	
	Session 4 – Mechanics of composite materials I (AM Ferreira and LFM da Silva)	
	Room B002	
16:20	Sandwich structures for orbital debris protection – analysis of shielding performance and numerical modelling (MS24_5) <u>A Cherniaev</u> (University of Windsor, Canada)	
16:40	Interfacial feature strengthening of Fiber Metal Laminates parts under in-situ hybridization forming (MS24_7) <u>M Liang</u> (Shanghai Jiao Tong University, China), W Zhang, X Zhuang, Z Zhao	
17:00	Mechanical response of graphene reinforced composites (MS24_10) <u>JM Parente</u> (University of Beira Interior, Portugal), PNB Reis	
17:20	Study on high speed impact behavior of composite scarf patch repair structures (MS24_11) <u>XF Yao</u> (Tsinghua University, China), ZC Feng, HL Yang, SY Xuan	
17:40	Novel CALNAgN coatings for dry machining operations: high temperature tribological behaviour, machining performance and FE simulations (MS24_22) <u>F Fernandes</u> (University of Coimbra, Portugal), SS Rajput, ChS Kumar, S Gangopadhyay, A Cavaleiro	
18:00	The role of agglomeration in the material properties of polymer-based nanocomposites (MS24_54) <u>A Zeinedini</u> (Kermanshah University of Technology, Iran)	
18:30	Poster session and RECEPTION (Room under the Auditorium)	
	Mechanical behaviour of materials	
Poster 1	Exploring mechanical and fracture properties of an acrylic PSA: An experimental investigation of influential parameters (MS24_36)	<u>BD Simões</u> (INEGI, Portugal), EAS Marques, RJC Carbas, S Maul, P Stihler, P Weißgraeber, LFM da Silva
Poster 2	Design and modelling of impact resistant bio-inspired structures (MS24_43)	<u>EAS Marques</u> (University of Porto, Portugal), RJC Carbas, MM Kasaei, LFM da Silva
	Mechanics of composite materials	
Poster 3	Strategies to reduce delamination in composite adhesive joints using hybrid-CFRP adherends (MS24_39)	<u>RJC Carbas</u> (INEGI, Portugal), EAS Marques, LFM da Silva
	Fracture mechanics and Fatigue	
Poster 4	J-integral vs. CBBM in mode I fracture analysis of adhesive joints (MS24_9)	<u>B Reket</u> (INEGI, Portugal), M Ferreira, M Ribas, B Simoes, A Akhavan-Safar, RJC Carbas, EAS Marques, LFM da Silva
	Mechanical behaviour of structures	
Poster 5	Design, simulation and experimental validation of a polyurethane-coated steel wheel for agricultural applications (MS24_26)	<u>L Solazzi</u> (University of Brescia, Italy), M Cima
Poster 6	Exploring adhesive performance in horseshoe bonding through advanced mechanical and numerical analysis (MS24_55)	<u>CMC Ferreira</u> (INEGI, Portugal), BD Simões, EAS Marques, RJC Carbas, LFM da Silva
Poster 7	Natural oscillations in viscoelastic mechanical model of the Cosserat-type media (MS24_56)	<u>GL Brovko</u> , <u>ED Martynova</u> , <u>VV Kozhukhov</u> (MV Lomonosov Moscow State University, RF)

Room B032

8:40' **Dynamic behavior of structures subject to different wind schematizations (MS24_48)**
 L Solazzi (Università degli Studi di Brescia, Italy)

Session 5 – Mechanical behaviour of structures

(Chair: L Solazzi and EAS Marques)

Room B032

9:20 FEM-based numerical experiment for simulation of shear key joint behavior in arch dams (MS24_24)
 A Nanevska (University of Ss. Cyril and Methodious, RN Macedonia), V Mircevska

9:40 A novel numerical approach for modelling complex failure mechanism in friction stir spot welded joints (MS24_23)
 EAS Marques (University of Porto, Portugal), RJC Carbas, FJRC Moreira, LDVSR Peixoto, R Beygi, LFM da Silva

10:00 Strengthening adhesively bonded composite joints with polymer and metal thin layers for substrate reinforcement (MS24_38)
 H Malekinejad (INEGI, Portugal), RCJ Carbas, EAS Marques, LFM da Silva

10:20 Characterization and dynamic performance of adhesive bonds in structural applications (MS24_33)
 A Akhavan-Safar (INEGI, Portugal), EAS Marques, RJC Carbas, LFM da Silva

10:40-11:00 COFFEE BREAK (Room under the Auditorium)

Session 6 – Mechanics of composite materials II

(BP Patel and AM Ferreira)

Room B032

11:00 Enhancing transverse tensile performance: Gradual modification of CFRP laminate with thin-ply (MS24_17)
 H Malekinejad (INEGI, Portugal), RCJ Carbas, EAS Marques, LFM da Silva

11:20 Influence of temperature on the performance of hybrid composite joints (MS24_19)
 RCJ Carbas (INEGI, Portugal), F Ramezani, EAS Marques, LFM da Silva

11:40 Composite structures response to compression after impact events for aerospace Applications (MS24_29)
 AH Baluch (King Fahd University of Petroleum & Minerals, Saudi Arabia)

12:00 Nonlinear periodic response of sandwich beams using shooting technique (MS24_27)
 D Kumar, BP Patel (Indian Institute of Technology Delhi, India)

12:20 Investigating peel testing behaviour of acrylic pressure-sensitive adhesives: A comparative study (MS24_37)
 BD Simões (INEGI, Portugal), HC Sousa, EAS Marques, RJC Carbas, S Maul, P Stihler, P Weißgraeber, LFM da Silva

12:40 Strength improvements of wooden joints by using tough layer technique (MS24_42)
 Sh Jalali (INEGI, Portugal), EAS Marques, RJC Carbas, LFM da Silva

13:00-14:00 LUNCH BREAK (Room under the Auditorium)

Room B032

14:00' **Recent advances in peridynamics applied to piezoelectricity, multibody dynamics and topology optimization (MS24_32)**
 FS Vieira, AL Araujo (University of Lisbon, Portugal)

Session 7 – Vibration of discrete and continuous systems

(Chair: EAS Marques and F Tornabene)

Room B032

14:40 Higher order modelling of anisotropic doubly-curved shells made of smart anisotropic materials (MS24_2)
 F Tornabene, M Viscoti (University of Salento, Italy), R Dimitri

15:00	Seismic qualification of nuclear components (MS24_3) <u>CAJ Miranda</u> (Instituto de Pesquisas Energéticas e Nucleares, São Paulo, Brazil)
15:20	Study of the effect of new materials and structural joints in the dynamic behaviour of road vehicles (MS24_16) <u>P Millan</u> (University of Lisbon, Portugal), J Ambrósio, EAS Marques, LFM da Silva
15:40	Nonlinear vibration analysis of delaminated composite airfoils in supersonic flow (MS24_18) <u>B Hauck</u> (Budapest University of Technology and Economics, Hungary), A Szekrényes
16:00-16:20	COFFEE BREAK (Room under the Auditorium)
	Session 8 – Thermal and electrical effects in solids (Chair: AL Araujo and MM Kasaei)
	Room B032
16:20	Friction stir welding and laser welding: Optimizing multi-material joining for diverse industrial applications (MS24_53) <u>EAS Marques</u> (University of Porto, Portugal), R Beygi, RJC Carbas, LFM da Silva
16:40	Thermo-mechanical model of a hybrid rocket combustion chamber using ablative thermal protection systems (MS24_35) <u>F Cadavez</u> (University of Lisbon, Portugal), A Souza, A Suleman
17:00	Self-heating effect in 3D printed composites (MS24_45) <u>PNB Reis</u> (University of Coimbra, Portugal), A Katunin, J Amraei, T Rogala, D Wachla
17:20	A new busbar-prismatic cell connection for electric vehicles: thermo-electrical analysis (MS24_40) VB Gomes, <u>MM Kasaei</u> (University of Porto, Portugal), RJC Carbas, EAS Marques, LFM da Silva
17:40	Thermo-electrical performance of hybrid busbars manufactured by a novel joining process for electric vehicle batteries (MS24_41) <u>MM Kasaei</u> (INEGI, Portugal), DPM da Costa, RJC Carbas, EAS Marques, LFM da Silva
20:00	MS 2024 BANQUET (Restaurant UVA by Calem)