

XVI International Conference on Computational Plasticity. Fundamentals and Applications

Technical Programme

Tuesday, 07-09-2021

10:30 - 13:30 (Europe/Madrid), Auditorium
Registration

14:00 - 14:15 (Europe/Madrid),
Inauguration of the conference

14:15 - 15:30 (Europe/Madrid), Auditorium
TA - PL1 - Plenary Session I - P. Wriggers and T. Hughes

Computational Plasticity based on the Virtual Element Method
P. Wriggers*

FEA and IGA in Nonlinear Computational Mechanics (ONLINE)
T. Hughes*

15:30 - 16:00 (Europe/Madrid),
Delivery of IACM and ECCOMAS Awards

16:00 - 16:30 (Europe/Madrid),
Coffee Break

16:30 - 18:30 (Europe/Madrid), Auditorium
TA1 - CS - Damage, Fracture and Fatigue I

Thermal ageing of electronic component solder joints for space applications
V. Voet*, F. Van Loock, C. De Fruytier, A. Simar, T. Pardoen

Gradient-enhancement for finite plasticity-damage material models at excessive strains based on the logarithmic strain space (Online)
(Online)
J. Friedlein*, J. Mergheim, P. Steinmann

Two-scale damage modeling in nuclear waste packages with phase field modeling of microcracking due to corrosion product expansion
(Online)
M. Benaimche*, J. Yvonnet, B. BARY, Q. HE

Molecular Dynamics Study on Dynamic Void Nucleation, Void Growth and Breakdown of Elastomeric Block-Copolymer: from Molecular Mechanisms to Macroscopic Rules (Online)
K. Yao*, Z. liu, Z. zhuang

Crack phase-field modeling for ductile fracture coupled with non-local plasticity (Online)
J. Han*, S. Matsubara, S. Moriguchi, K. Terada

Assessment of Hydrogen Gas Effects on Al 6061-T6 by using Extended Finite Element Method (Online)
D. Kim*, Y. Chang, U. Baek

16:30 - 18:30 (Europe/Madrid), Room VS208

TA2 - IS - Advanced computational modelling of wood, wood-based products, and timber structures
Organized by: J. Füssl, M. Lukacevic, M. Kaliske, and J. Eberhardsteiner

Computational Modeling Approach for Wood-Based Products and Timber Structural Elements
M. Lukacevic*

Identification of fracture properties and investigation of toughening mechanism of optically transparent wood polymer composites
E. Jungstedt*

Phase field method-based modeling of fracture in wood
S. Pech*

Numerical Simulation of Moisture Transport in Wood including Free Water Transport (Online)
M. Autengruber*, M. Lukacevic, J. Füssl, J. Eberhardsteiner

FE-Analysis of end-notched beams and tenon joints – J-Integral versus cohesive zone modelling (Online)
T. Claus*

Effect of morphological irregularities on the effective hygro-elastic properties of softwood and hardwood (Online) (Online)
M. Livani*

16:30 - 18:30 (Europe/Madrid), Room VS218

TA3 - IS - Implicit Calculations and Multiplicative Elastoplasticity

Organized by: Y. Yamakawa and K. Hashiguchi

A systematic and thermodynamically consistent extension of anisotropic thermo-elastoviscoplastic constitutive laws at finite transformations

M. Abatour*, S. Forest, K. Ammar, C. Ovalle-rodas, N. Osipov, S. Quilici, B. Marchand

Numerical Simulation for Sintering Process of Ceramics with Master Sintering Curve (Online)

C. Natsumeda*, K. Matsui, T. Yamada

Simultaneously Iterative Procedure Based on Block Newton Method for Elastoplastic Problems in Small Strains (Online)

T. Yamamoto*, T. Yamada, K. Matsui

16:30 - 18:30 (Europe/Madrid), Room VS216

TA4 - IS - Multi-Scale and Computational Scale Bridging I

Organized by: V. Kouznetsova, J. Schröder and K. Terada

Phase field Cosserat plasticity towards modeling nucleation

F. Ghiglione*, A. Ask, K. Ammar, B. Appolaire, S. Forest

Data-Driven Multiscale Computing in Mechanics

K. Karapiperis*, L. Stainier, M. Ortiz, J. Andrade

Fully implicit coupled analysis for finite thermo-viscoelasticity with resin cure: application to multiscale analysis (Online)

Y. Yamanaka*, S. Matsubara, S. Moriguchi, K. Terada

Multiscale Viscoelastic Analysis of Plain Weave Textile Composites Combining First Order Homogenization and Mori-Tanaka Method (Online)

J. Vorel*, M. Šejnoha, S. Valentová

Nonequilibrium Thermomechanics of Gaussian Phase Packet Crystals: Nonequilibrium Statistical Operator Approach (Online)

P. Gupta*, M. Spinola, S. Saxena, D. Kochmann

A new homogenization scheme based on energy and kinematic preservation: application for predicting dispersion of macroscopic material strength on ferrite-perlite steel (Online)

D. Imai*, Y. Shintaku, K. Terada

16:30 - 18:30 (Europe/Madrid), Room VS206

TA5 - IS - Advanced Modeling and Simulation in Biomechanics: from Molecules to Tissues I

Organized by: G. Holzapfel and J. M. García-Aznar

Predictive constitutive modeling of arteries through deep learning (Online)

K. Linka*, S. Sherifova, C. Cyron, G. Holzapfel

Uncertainty quantification of stochastic, heterogeneously degraded aortic tissues (Online)

M. Rolf-Pissarczyk*, G. Wolkerstorfer, S. Ranftl, A. Pepe, W. von der Linden, G. Holzapfel

A computational study of bio-chemo-mechanical role of intraluminal thrombus in the aneurysm progression using finite elements

L. Virag*, N. Horvat, I. Karšaj

A fluid-solid growth study of thrombus-laden aneurysm progression

I. Karšaj*, L. Virag, N. Horvat, J. Živic

16:30 - 18:30 (Europe/Madrid), Room VS219

TA6 - IS - Continuum Damage and Cyclic Plasticity in Fatigue Life Estimate

Organized by: Lucival Malcher

Link between the microstructure and the durability of polycrystalline materials: a fatigue damage model in aluminium alloy

M. Lenglet*, A. Ask, S. Forest, P. Kanouté, S. Kruch

Effects Of The Third Invariant On The Fatigue Life Assessment Of Metallic Materials in Low Cycle Conditions (Online)

L. Mangas Araújo*, L. Malcher

Evaluation of a fracture indicator dependent on the normalized third invariant of the deviatoric stress tensor and equivalent plastic strain (Online)

L. Delgado Morales*, L. Malcher

Prediction of fracture toughness at steel bridge after cyclic loading by a CDM-like constitutive law combined with cohesive zone model and memory surface (Online)

F. Nakamura*, Y. Shintaku, S. Tsutsumi, K. Terada

Effect of the mean stress and the third invariant in the fatigue life assuming random loading and two scale model (Online)

L. Malcher*, R. Desmorat

16:30 - 18:30 (Europe/Madrid), Room VS215

TA7 - IS - Multiscale Modelling of Concrete and Concrete Structures

Organized by: H. Mang, B. Pichler, Y. Yuan

Numerical investigation of load sequence effect and energy dissipation in concrete due to compressive fatigue loading using the new microplane fatigue model MS1

M. Aguilar*, A. Baktheer, R. Chudoba

Evaluation of a multi-level approach for modelling the post-cracking response of steel fibre reinforced concrete under monotonic and cyclic loading

V. Gudzulić*, G. Neu, G. Meschke

Spontaneous and reversible water uptake/release by nanoscopic cement hydrates explains thermal expansion of cement pastes

H. Wang, C. Hellmich, Y. Yuan, H. Mang, **B. Pichler***

New results in 3D-mesomechanical coupled analysis of external sulphate attack in concrete

C. Biscaro*, A. Martínez, A. Pérez, C. López, G. Xotta, I. Carol

Permeability of micro-cracked concretes: from homogenization to percolation (Online)

L. li*, K. Li, R. Yang

Homogenization of mesoscale discrete model for poroelasticity (Online)

J. Elias*, G. Cusatis

Reduced order approximations of fine scale edge basis functions within a variational multiscale approach (Online) (Online)

P. Diercks*

16:30 - 18:30 (Europe/Madrid), Room VS217

TA8 - CS - Computational Material Design

Multiscale technics to analysis of elastoplastic properties on Cast Super Duplex Stainless Steel

A. Costa*, M. Seabra, J. Visconti, J. César de Sá, A. Santos, L. Ribeiro

Virtual Clustering Analysis of numerical homogenization for elasto-plasticity (Online)

Y. Yang*, X. Zhu, L. Zhang, S. Tang

Influence of Topology Hybridization and Functional Grading on the Compressive Properties of TPMS-based Lattice Cores (Online)

C. Ejuh*, I. Barsoum, R. Abu Alrub

16:30 - 18:30 (Europe/Madrid), Room Sala de Actos

TA9 - CS - DEM, Material Point Method and Meshless Methods

A B-free local max-ent Material Point Method for fluid-saturated porous media at large strain

M. Molinos*, M. M. Stickler, P. Navas, M. Pastor, D. Manzanal, A. Yagüe, S. M. Tayyebi

Natural hazard induced damage assessment of structures via a fully Lagrangian coupled PFEM-FEM-DEM approach

A. Cornejo*, A. Franci, F. Zárata, E. Oñate

Modelling of heating, melting and solidification on additive manufacturing (AM) direct energy deposition (DED) processes

R. Darabi*, E. Azinpour, A. Ferreira, J. de Sa, A. Reis

MESHFREE generalized finite difference method for highly dynamic processes in soil mechanics (Online)

J. Kuhnert*, I. Michel

MPM-FEM Hybrid analysis for tsunami induced by submarine landslide (Online)

S. Pan*, Y. Yamaguchi, A. Suppasri, S. Moriguchi, K. Terada

Adaptive time stepping approach for Phase-Field modeling of phase separation and precipitates coarsening in additive manufacturing alloys (Online)

S. Fetni*, J. Delahaye, L. Duchêne, A. Mertens, A. Habraken

16:30 - 18:30 (Europe/Madrid), Room VS213

TA10 - IS - Cyclic Plasticity for Metals I

Organized by: K.i Hashiguchi and Y. Yamakawa

KEYNOTE LECTURE

Simulation of Elastic-plastic Crack Propagation Experiment under Large Cyclic Load using the Subloading Surface Model (Online)

H. Okada*, K. Shoda, S. Nakamura, K. Arai

New geometry-based model of directional distortional hardening for multiaxial ratcheting predictions.

R. Marek*, H. Feigenbaum, J. Stefan, S. Parma, J. Plešek

Experimental Investigation of Yield Surface Evolution and Strain Hardening of Boiler Steel under Biaxial Loading

S. Parma*, C. Ciocanel, J. Štefan, H. Feigenbaum, R. Marek, R. Halama, J. Plešek

16:30 - 18:30 (Europe/Madrid), Room VS214

TA11 - CS - Multi-Physics Problems

Vibration of the cantilever beam using a piezoelectric actuator.

V. Gaga*

Numerical Modelling of Two-Phase Flow in Fractured Rock Masses Using Zero-Thickness Interface Elements

L. Barandiaran*, J. Liaudat, C. López, I. Carol

MOR of Piezoelectric Beam FEM Model and its Control

V. Kutis*

Actuator structure analysis using new electro-thermo-mechanical finite element for functionally graded materials. (Online)

J. Paulech*

A meshfree generalized finite difference method for simulations of metal cutting processes with cooling lubricant (Online)

T. Seifarth, **P. Suchde***, J. Kuhnert, E. Barth

19:00 - 20:00 (Europe/Madrid),

Outdoor Reception

Wednesday, 08-09-2021

09:00 - 11:00 (Europe/Madrid), Auditorium

WM - PL2 - Plenary Session II - M. Geers, X. Oliver and K. Terada

Computational multiscale analysis of mechanical and dynamical metamaterials

M. Geers*

Towards Computational Multiscale Shock-Absorbing Metamaterial Design: From the Upper-Scale to the Low-Scale

X. Oliver*

Recent advances in FEMs and MPMs for Disaster Simulations (Online)

K. Terada*

11:00 - 11:30 (Europe/Madrid),

Coffee Break

11:30 - 13:30 (Europe/Madrid), Auditorium

WM1 - CS - Damage, Fracture and Fatigue II

FE Modelling of Structural Size Effect in Quasi-Brittle Materials with Enhanced Accuracy

G. Barbat*, M. Cervera, M. Chiumenti

Extended size effect emerging from the precursors to compressive failure

A. Mayya*, E. Berthier, L. Ponson

Mode I+III multiscale cohesive zone model: applications to facet orientation and toughening

V. Lazarus*

Finite Volume Implementation of Damage Mechanics and Fracture Models (Online)

A. Whelan*, M. Clancy, V. Pakrashi, M. Celikin, P. Cardiff

Application of a Fatigue Phase Field Framework for Fitting a Paris Diagram of a WE43C-T5 Magnesium Alloy (Online)

M. Vale*, J. Ávila Díaz, G. Pereira, W. Bose Filho, J. Boldrini, M. Bittencourt

Embedded Discontinuity Finite Element Method (ED-FEM) for Modeling Fiber Failures in Random Fiber Networks

V. Tojaga*, A. Kulachenko, S. Östlund

11:30 - 13:30 (Europe/Madrid), Room VS208

WM2 - CS - Multi-Scale Material Models I

Computational multiscale modelling of chemo-hygro-mechanical degradation of paper

A. Parsa Sadr*, E. Bosco, A. Suiker

Multi-scale model to study the long-term mechanical behaviour of a dam affected by alkali-silica reaction

E. Gallyamov*, M. Corrado, J. Molinari

Multiscale modelling of the thermo-hydrmechanical behaviour of argillaceous rocks

N. Zalamea*, P. Besuelle, S. Dal Pont, A. Di Dona

Thermo-mechanically coupled analyses for dissipative composites considering transient change of microscopic temperature (Online)

S. Matsubara*, D. Okumura, K. Terada

11:30 - 13:30 (Europe/Madrid), Room VS218

WM3 - CS - Advanced Material Models I

FE Simulation of Ratcheting Using Advanced Kinematic Hardening Rules

V. Klepac*, S. Parma, R. Marek, H. Feigenbaum, J. Plešek

A Comparison of FE Analysis of Columns Utilizing Two Stress-Strain Material Relations and Two Different Solvers: ANSYS vs. SCIA Engineer

D. Jindra*, Z. Kala, J. Kala

Some Computational Issues in the Elasto-Plastic Modelling of Snow (Online)

G. Vallerio*, M. Barbero, F. Barpi, M. Borri-Brunetto, V. De Biagi

New formulation of metallic materials constitutive models by an energy approach (Online)

B. Saade, **A. Gavrus***, J. Bodgi, N. Bejjani

Phenomenology and statistical thermodynamics of dislocation plasticity (Online)

V. Berdichevsky*

Numerical aspects of single crystal plasticity based on the infeasible primal-dual interior point method (Online)

L. Scheunemann*, P. Nigro, J. Schröder

11:30 - 13:30 (Europe/Madrid), Room VS216

WM4 - IS - Multi-Scale and Computational Scale Bridging II

Organized by: **V. Kouznetsova, J. Schröder and K. Terada**

Modelling viscoelastic properties of solid wood based on simple cellular structures via computational homogenization

R. Bengtsson*, M. Mousavi, R. Afshar, K. Gamstedt

Asymptotic homogenization for the modeling of arrays of coupled resonant plates. Analysis of combined Fano and Fabry-Perot resonances

J. Zhou Hagstrom*, A. Maurel, K. Pham

An Investigation of the Effect of Deformation Twinning on the Ductility of Nano-polycrystalline Aluminum Using an Atomic-continuum Multiscale Simulation Method (Online)

Y. Yamazaki*, T. Murashima, M. Muramatsu

Phase-field Crack Simulation of High Tensile Strength Steel Considering the Effect of Plastic Deformation (Online)

K. Satake*, K. Okada, M. Muramatsu

A Multi-scale Approach Towards Prediction of the Phase Interface Damage Initiation in Advanced Multi-phase Steels (Online)
L. LIU*, F. Maresca, J. Hoefnagels, M. Geers, V. Kouznetsova

11:30 - 13:30 (Europe/Madrid), Room VS206

WM5 - IS - Advanced Modeling and Simulation in Biomechanics: from Molecules to Tissues II

Organized by: **G. Holzapfel, J. M. García-Aznar**

Computational Modeling of the Vesicle-Mediated Cell Transport

D. Haspinger*, S. Klinge, G. Holzapfel

The Influence of Binder Mobility to the Viral Entry Driven by the Receptor Diffusion (Online)

S. Klinge*, T. Wiegold, R. Gilbert, G. Holzapfel

A mechano-osmotic model to uncover the role of gap junctions in cell swelling within proliferative tumour organoids (Online)

E. McEvoy*, Y. Han, M. Guo, V. Shenoy

3D vertex model for multicellular reorganisation (Online)

J. Munoz*

Computer-based modeling and simulation of neuroblastoma growth (Online)

S. Hervas-Raluy*, M. Gomez-Benito, J. Garcia-Aznar

A 3D finite element-based approach for computing cellular forces under large deformations (Online)

J. Garcia-Aznar*

11:30 - 13:30 (Europe/Madrid), Room VS219

WM6 - IS - Computational Modeling of Material Forming Processes I

Organized by: **J.P. Ponthot, C. Agelet de Saracibar and R.A.F. Valente**

(Dedicate to the memory of Prof. Lionel Fourment)

On solving inconsistencies between different types of hardening models

S. Cooreman*, S. Coppieters

Gradient-extended model for anisotropic, ductile damage. (Online)

H. Holthusen*, T. Brepols, S. Reese, J. Simon

An Adaptive Finite Element strategy for the numerical simulation of Additive Manufacturing processes

J. Baiges*, M. Chiumenti, C. Moreira, M. Cervera, R. Codina

Performance analysis of AM structures built using Fused Filament Fabrication

N. Dialami*, M. Chiumenti, M. Cervera, U. Chasco, G. Reyes-Pozo, M. Pérez

Simulation of the selective laser melting process: Influence of processing parameters (Online)

S. Garzon-Hernandez*, A. Jerusalem

Computational Modeling of Metal Forming processes - Main contribution of Lionel Fourment (Online)

K. Mocellin*

11:30 - 13:30 (Europe/Madrid), Room VS215

WM7 - IS - Multi-Scale Plasticity, Damage Models & Scale Bridging I

Organized by: **M. Geers and J. Yvonnet**

Dislocation dynamics prediction of the strength of Al-Cu alloys containing impenetrable (θ') and shearable (θ'') precipitates

R. Santos-Güemes, B. Bellón, J. Segurado, **J. LLorca***

Predicting the transformation strain that controls ductility and toughness in advanced steels

F. Maresca*, E. Polatidis, M. Smid, H. Van Swygenhoven, W. Curtin

Comparison of strategies to account for X-ray-tomography-identified pores in the simulation of ductile fracture

C. Cadet*, J. Besson, S. Flouriot, S. Forest, P. Kerfriden, L. Lacourt, F. N'Guyen, V. de Rancourt

Two-scale FE-FFT computational modeling of microstructure evolution and macroscopic behavior in polycrystals (Online)

C. Gierden, J. Kochmann, J. Mianroodi, **B. Svendsen***, S. Reese

An optimized method for the simulation-based determination of initial parameters of advanced yield surfaces for sheet metal forming applications (Online)

F. Roters*, A. Nascimento, S. Roongta, M. Diehl

Concurrent irradiation-mechanics coupling model based on dislocation and cluster dynamics (Online)

Y. Cui*, C. Ji, Y. Li, N. Ghoniem

11:30 - 13:30 (Europe/Madrid), Room VS217

WM8 - IS - Size Effects in Plasticity and Fracture I

Organized by: **E. Martínez-Pañeda, C.Niordson and B. Klusemann**

KEYNOTE

Microscopic phase-field chemomechanical and atomistic modelling of dislocation-solute interaction in binary alloys

J. Rezaei Mianroodi*, B. Svendsen, D. Raabe

Phase field modelling of pitting and stress corrosion cracking

E. Martínez-Pañeda*, C. Cui

Computational modelling of stress-assisted oxidation and intergranular fracture of polycrystals.

K. Auth*, J. Brouzoulis, M. Ekh, R. Jänicke

Investigation of the temperature-driven evolution of Al₃Mg₂ and Al₁₂Mg intermetallic compound during solid-state joining of an Al-Mg alloy via the multiphase-field method coupled with CALPHAD (Online)

B. Klusemann*

Phase-field modeling of martensitic transformation during nano-indentation: microstructure and size effects. (Online)

M. Rezaee Hajidehi*, S. Stupkiewicz

11:30 - 13:30 (Europe/Madrid), Room Sala de Actos

WM9 - IS - Isogeometric Methods I

Organized by: A. Reali, T. Hughes and G.Lorenzo

A rigorous and explicit algorithm for irreversibility enforcement in finite element and isogeometric computations of phase-field brittle fracture

A. Marengo, **A. Patton***, M. Negri, U. Perego, A. Reali

IGA application on crashworthiness CAE analysis in the automotive industry

L. Martorell*, R. Rossi, L. Barbu, E. Martin, P. Cruz

Finite Strain Plasticity in a Boundary-Conforming Eulerian Framework (Online)

E. Salzmänn*, F. Zwicke, S. Elgeti

A Viscoelastic Material Model for the Isogeometric Analysis of Steady-State Rolling Tires (Online)

A. Israfilova*, M. Garcia, M. Kaliske

An isogeometric frictionless contact formulation for Cosserat rods with extensible director kinematics of arbitrary order (Online)

M. Choi*, R. Sauer, S. Klinkel

11:30 - 13:30 (Europe/Madrid), Room VS203

WM10 - IS - Meshfree, Peridynamics, and Particle Methods: Contemporary Methods and Applications I

Organized by: J-S. Chen, J. Foster, M. Hillman and P. Seleson

An innovative method to manage non-local boundaries in ordinary state-based Peridynamics.

F. Scabbia*, M. Zaccariotto, U. Galvanetto

Peridynamic modelling and experimental characterization of polymer/clay nanocomposites (Online)

G. Ongaro*, R. Bertani, U. Galvanetto, M. Zaccariotto

A Variational Multiscale Immersed RKPM method for Fluid-Structure Interactive Systems in Blast Event (Online)

T. Huang*, J. Chen

Quasistatic Fracture Modeling Using Peridynamics (Online)

D. Bhattacharya, P. Diehl, **R. Lipton***

Data-driven learning of peridynamic models for graphene sheets (Online)

H. You*, Y. Yue, S. Silling, M. D'Elia

A General-Purpose, Inelastic, Rotation-Free Shell Formulation for Peridynamics (Online)

M. Behzadinasab*, M. Alaydin, N. Trask, Y. Bazilevs

11:30 - 13:30 (Europe/Madrid), Room VS213

WM11- IS - Cyclic Plasticity for Metals II

Organized by: : K.I. Hashiguchi and Y. Yamakawa

Classification and assessment of cyclic plasticity models (Online)

K. Hashiguchi*

Spring-back prediction with the subloading surface plasticity model (Online)

M. Tateishi*

Evaluation of Thermal Fatigue Life of Solder Joints in Electronic Devices Based on Stress and Strain Singularity Parameters (Online)

J. Liu*

Evaluation of constitutive models in predicting ratcheting responses of a structure under thermo-mechanical loadings

J. Macedo*, J. Bergeau, E. Feulvarch, H. Battie, O. Ancelet, A. Martin, S. Chapuliot

11:30 - 13:30 (Europe/Madrid), Room VS214

WM12 - IS - Hybrid Modelling of Mechanics of Materials: Data Enriching Models and Models Rendering Data Smarter I

Organized by: F. Chinesta, E. Cueto and P. Ladeveze

On the data-driven simulation of history-dependent materials

E. Cueto*

Data-Driven Modeling of Induction Heating Process

K. Derouiche*, M. Daoud, K. Traidi, F. Chinesta

Dislocation Detection and Velocity Measurement During Deformation of Metals Using Machine Learning and Particle Filter (Online)

K. Sasaki*, K. Hirayama, K. Endo, M. Murayama, M. Muramatsu

Estimation of Defects in Carbon Fiber Reinforced Plastic Based on Surface Pressure by Machine Learning (Online)

Y. Kojima*, K. Endo, K. Hirayama, K. Hiraide, M. Muramatsu

13:30 - 14:30 (Europe/Madrid),

Lunch Break

14:30 - 16:00 (Europe/Madrid), Auditorium

WA - PL3 - Plenary Session III - P. Ladevèze and W. Liu

A data-driven computation approach for history-dependent materials

P. Ladevèze*

Hierarchical Deep Learning Neural Network (HiDeNN): an Artificial Intelligence (AI) Framework for Computational Plasticity (ONLINE)

W. Liu*

16:00 - 16:30 (Europe/Madrid),

Coffee Break

16:30 - 18:30 (Europe/Madrid), Auditorium

WA1 - CS - Damage, Fracture and Fatigue III

Characterization of Plasticity and Fracture Behavior of Aluminum 6061-T4 Sheet for Deep Drawing Simulation

S. Hoque*, F. Duddeck

Application of an isotropic damage based high-cycle fatigue constitutive law to the study of degradation processes in high-speed railway tracks

S. Jiménez*, L. Barbu, S. Oller, E. Oñate

Fracture model based on lattice with embedded strong discontinuities and appropriate choice of discrete elastic parameters

M. Nikolic*

Non-associative plasticity and fracture: variational formulation and applications to failure in geomaterials and fatigue

J. Ulloa*, J. Wambacq, R. Alessi, G. Degrande, S. François

3D numerical modelling of ductile failure by a XFEM/cohesive zone model coupling (Online)

J. Crété*, K. Nikolakopoulos, P. Longère

16:30 - 18:30 (Europe/Madrid), Room VS208

WA2 - CS - Multi-Scale Material Models II

Digital twinning to predict the residual life of composite pressure vessels

N. Klebi*, P. Kerfriden, B. Marchand, A. Thionnet

Multi-scale modelling of carbonation of self-healing concrete

B. Freeman*, E. Masoero, E. Javierre, I. Mihai, A. Jefferson

A mixed Finite Element–Virtual Element two-scale homogenization scheme (Online)

B. Hudobivnik*, C. Böhm, M. Marino, P. Wriggers

Computational homogenization via the Virtual Element Method at electro-magneto-mechanical responses of polycrystalline materials (Online)

C. Böhm*, B. Hudobivnik, M. Marino, P. Wriggers

Deep material networks for characterizing fiber-reinforced thermoplastics subjected to long-term loading (Online)

A. DEY*, F. WELSHINGER, M. SCHNEIDER, S. GAJEK, T. BÖHLKE

16:30 - 18:30 (Europe/Madrid), Room VS218

WA3 - CS - Advanced Material Models II

Geometrically exact integral-based nonlocal model of ductile damage: basic properties and numerical treatment

A. Shutov*, V. Klyuchancev

Thermomechanical FEM-based modelling for semi-crystalline polymers exhibiting the double yield phenomenon

P. Hao*, V. Laheri, F. Gilabert

Non-iterative numerical implementation for the constitutive modelling of pressure-dependent elastoplasticity using paraboloidal yield criteria

V. Laheri*, P. Hao, F. Gilabert

Implicit Material Models (Online)

N. Fry*, M. Profit, C. Li

Effect of Lode Parameter and Stress Triaxiality on the Effective Plastic Yield Properties of Triply Periodic IWP Ligament-Based Minimal Surface (Online)

N. Baghous*, I. Barsoum, R. Abu Al-Rub

A 3D Facet Yield Function for Generalized Plane Stress Conditions in Sheet Forming Processes (Online)

H. Ghiabakloo*, N. Manopulo, B. Carleer, T. Nguyen-Minh, L. Kestens, A. Van Bael

16:30 - 18:30 (Europe/Madrid), Room VS216

WA4 - IS - Multi-Scale and Computational Scale Bridging III

Organized by: **V. Kouznetsova, J. Schröder and K. Terada**

KEYNOTE LECTURE

Non-Intrusive and Non-Conforming Interface Coupling for the Second-Order Global-Local Analysis of Heterogeneous Structures

O. Allix*, M. Wangermez, P. Guidault, C. Rey

Stress minimization for lattice structures

A. Ferrer*, P. Geoffroy-Donders, G. Allaire

Homogenization based two-scale modelling of fluid-saturated porous media with self-contact and flow in micropores

Coarse Graining of Lattice Green Functions for Atomistic-Continuum Coupling

A. Gupta*, M. Hodapp, W. Curtin

Microstructural uncertainty propagation in experimentally driven crystal plasticity simulations via model reduction and machine learning

A. Marano*, D. Ryckelynck, C. Ribart, H. Proudhon

On the investigation of different cooling strategies on hot formed parts and their influence on residual stresses (Online)

S. Uebing*, L. Scheunemann, D. Brands, J. Schröder

16:30 - 18:30 (Europe/Madrid), Room VS206

WA5 - IS - Advanced Modeling and Simulation in Biomechanics: from Molecules to Tissues III

Organized by: G. Holzapfel and J. M. García-Aznar

Numerical investigation on the mechanobiology of collagen growth and remodeling in abdominal aortic aneurysms

M. Dalbosco*, T. Carniel, E. Fancello, G. Holzapfel

Mechanical and Structural Properties of the Cranial Meninges

D. Walsh*, D. Newport, J. Mulvihill

Predicting outcomes in sagittal craniosynostosis corrective techniques (Online)

C. Cross*

Energy Dissipation Mechanisms of Non-Collagenous Proteins at Mineral Interfaces in Bone

M. Tavakol*, T. Vaughan

16:30 - 18:30 (Europe/Madrid), Room VS219

WA6 - IS - Computational Modeling of Material Forming Processes II

Organized by: J.P. Ponthot, C. Agelet de Saracibar and R.A.F. Valente

(Dedicate to the memory of Prof. Lionel Fourment)

Design and validation of a heterogeneous interior notched specimen for material mechanical characterisation

M. Conde*, A. Campos, S. Coppieters

On the design of mechanical heterogeneous specimens using both parametric and topology optimization

M. Gonçalves*, A. Andrade-Campos, J. Dias-de-Oliveira

Stress, strain and dissipation accurate FE technology for metal forming applications.

H. Venghaus*, M. Chiumenti, J. Baiges, D. Juhre

New multifield plasticity approach for large strain flow forming simulations (Online)

K. Lewandowski*, D. Barbera, A. McBride, L. Kaczmarczyk, C. Pearce, P. Steinmann

Measurement of Flow Stresses at High Strain Rates and Temperatures for Improved Simulation of Friction Stir Welding (Online)

D. Prymak, **M. Miles***, T. Nelson, F. Michael

Thermo-elastoplasticity framework for modelling large strain deformation in flow forming process (Online)

U. Barbera*, U. Lewandowski, U. McBride, U. Steinmann, U. Pearce, U. Kaczmarczyk

16:30 - 18:30 (Europe/Madrid), Room VS215

WA7 - IS - Multi-Scale Plasticity, Damage Models & Scale Bridging II

Organized by: M. Geers and J. Yvonnet

Fatigue Analysis of Lattice Materials Based on Computational Homogenization

D. Molavitabrizi*, M. Mousavi

A computational homogenisation approach to assess the strain localisation due to damage in fibre networks

F. Rocha*

The torsion problem in strain and stress gradient elasto-plasticity

S. Forest*

Rare-event sampling and the search for the carriers of plastic deformation in polymer glasses (Online)

G. Vogiatzis, R. Mols, L. van Breemen, **M. Hütter***

Identification of macro phase field fracture models from micro and heterogeneous structure calculations (Online)

J. Yvonnet*, P. Li, N. Nguyen, D. Hun, J. Guilleminot

An anisotropic elastoplastic phase field damage model for 3D printed materials and its experimental verification (Online)

P. Li*, J. Yvonnet

16:30 - 18:30 (Europe/Madrid), Room VS217

WA8 - IS - Size Effects in Plasticity and Fracture II

Organized by: E. Martínez-Pañeda, C.Niordson and B. Klusemann

KEYNOTE LECTURE

Predicting the yield behavior of polycrystalline aggregates using a generalized Schmid factor approach

C. Alleman*

Micropolar elasto-plasticity and dislocation density-based model: Size Effect and Regularization

R. Russo*, S. Forest, F. Giroto Mata

Strain hardening in a strain gradient plasticity material reinforced by small elastic particles: Theory and comparison with experiments

P. Croné*, J. Faleskog, P. Gudmundson

On the effect of slip transfer at grain boundaries on the strength and ductility of polycrystals

E. Nieto-Valeiras*, S. Haouala, D. Barba, J. LLorca

Inertia and material size effects on necking of notched bars under dynamic loading (Online)

R. Andersen*, K. Nielsen

16:30 - 18:30 (Europe/Madrid), Room Sala de Actos

WA9 - IS - Isogeometric Methods II

Organized by: A. Reali, T. Hughes and G.Lorenzo

Advanced isogeometric modeling of shells with a special focus on laminates

A. Reali*

Approximation with isogeometric spline spaces and explicit error estimates

E. Sande*, C. Manni, H. Speleers

Refinement strategies for 3D lifting flows using an IGA-BEM solver (Online)

S. Chouliaras, **K. Kostas***, A. Ginnis, C. Politis, P. Kaklis

Stress and strain-based mixed formulations in NURBS-based isogeometric analysis (Online)

D. Bombarde*, S. Gautam, A. Nandy

Isogeometric collocation BEMs for 3D potential problems (Online)

A. Falini*

16:30 - 18:30 (Europe/Madrid), Room VS203

WA10 - IS - Meshfree, Peridynamics, and Particle Methods: Contemporary Methods and Applications II

Organized by: J-S. Chen, J. Foster, M. Hillman and P. Seleson

Investigating the mechanics of porous brittle solids with the Material Point Method and Gaussian Random Field microstructures

L. Biatny*, H. Löwe, J. Gaume

Consistent immersed volumetric Nitsche methods for composite analysis (Online)

J. Wang*, M. Hillman, Y. Bazilevs, A. Madra, J. Du

Nodally integrated thermo-mechanical RKPM with Application to Simulation of Additive Manufacturing (Online)

M. Hillman*

A Regularized Phase-field Reproducing Kernel Finite Volume Method with Application to High-Strength Concrete (Online)

S. Yang*

A Hybrid Finite Element and Peridynamics Approach: Formulation, Verification and Applications (Online)

Y. Sun, B. Chen, M. Edwards, **C. Li***

A Duality-based Cosserat Crystal Plasticity and Phase Field Theories for Grain Refinement Modeling (Online)

J. Baek*, J. Chen

16:30 - 18:30 (Europe/Madrid), Room VS213

WA11 - IS - Plasticity Modelling, Parameter Identification and Applications to Forming Operations

Organized by: Miguel Vaz Júnior

Influence of rate dependent plasticity on a sheet metal bending process (Online) (Online)

C. Reisinger*, C. Zehetner, H. Irschik, M. Krommer, W. Kunze

The incremental dieless drawing process for the manufacture of ultrafine wire from copper alloys

A. Milenin*

On the Development of Dataset Supported Strategies for the Constitutive Parameters Identification of Metal Sheets (Online)

P. Prates*, A. Pereira, J. Fernandes, N. Sakharova

Identification of Inelastic Parameters using Cubic Splines: Applications to Classical and Damaged Materials (Online)

J. Stahlschmidt, F. Andrade Pires, **M. Vaz Jr.***

16:30 - 18:30 (Europe/Madrid), Room VS214

WA12 - IS - Hybrid Modelling of Mechanics of Materials: Data Enriching Models and Models Rendering Data Smarter II

Organized by: F. Chinesta, E. Cueto and P. Ladeveze

Data-driven mechanics through the Frankenstein's method: from images to predictions

G. Lubineau*, A. Lagerweij, Y. Wang

Stiffness identification by efficient model calibration of random field variables for the Young's modulus (Online) (Online)

A. Robens-Radermacher*, I. Coelho Lima, J. Unger

Data-Driven and Hybrid Modeling for Hardness Predictions after Quenching Process

S. Garois*, M. Daoud, K. Traidi, F. Chinesta

Thursday, 09-09-2021

09:00 - 11:00 (Europe/Madrid), Auditorium

ThM - PL4 - Plenary Session IV - J. Ponthot, S. Reese and Z. Zhang

New advances for evolving meshes/discretization methods in 3D large deformation problems. Application to metal forming, wear, crack propagation and fluid-structure interactions using FEM, DEM and PFEM

J. Ponthot*

Data-driven mechanics – interesting aspects in the modelling of inelastic behaviour

S. Reese*

Data-driven based modulus prediction of cancellous bone and 3D printing for defect repair in clinic treatment (ONLINE)

Z. Zhang*

11:00 - 11:30 (Europe/Madrid),

Coffee Break

11:30 - 13:30 (Europe/Madrid), Auditorium

ThM1 - CS9 - Damage, Fracture and Fatigue IV

A variationally coupled phase-field-interface model for brittle and ductile fracture in composite structures

J. Wambacq*, J. Ulloa, G. Lombaert, S. François

Phase-field numerical modeling of fatigue fracture

E. Azinpour*, J. Sa, A. Santos, L. Ribeiro

Coupling of mechanics and transport in discrete meso-level model: model verification (Online)

J. Mašek*, J. Eliáš

An MD-FE coupling simulation method applied to fracture of viscoelastic-viscoplastic glassy polymers. (Online)

W. Zhao*, S. Pfaller

Performance investigation of quasi-Newton-based parallel large-deformation elastic-plastic analysis of crack problems (Online)

Y. Yusa*, S. Miyauchi, H. Okada

Incorporation of residual stresses in inelastic composites: geometrically exact setting (Online)

I. Tagiltsev*, A. Shutov

11:30 - 13:30 (Europe/Madrid), Room VS208

ThM2 - IS - Computational Structural Stability

Organized by: H. Mang and Y.-B. Yang

Geometric stiffness matrix of spatial curved Kirchhoff rods based on invariant isogeometric formulation

Y. Yang*, Y. Liu

Analytical computational models for buckling and postbuckling of thin-walled stiffened composite panels (Online)

J. Schilling*, C. Mittelstedt

11:30 - 13:30 (Europe/Madrid), Room VS218

ThM3 - IS - Damage Modeling of Concrete Structures Under Extreme Loading Conditions

Organized by: M. Kaliske, A. Pandolfi, M. Ortiz and B. Sluys

Mesoscopic Modelling of the Behaviour of Interfaces between Reinforcing Steel and Concrete (Online)

M. Abbas*, B. Bary, L. Jason

Iterative strategies based on constitutive dissipation

L. Crusat*, I. Carol

Non-local numerical treatment of non-linear behavior by means of Helmholtz equation, with variable coefficients. Application to reinforced concrete structures. (Online)

R. Gontero*, A. Millard, T. Vidal, A. Sellier, L. Sorelli

A porous brittle damage material model applied to geosciences

A. Pandolfi*

11:30 - 13:30 (Europe/Madrid), Room VS216

ThM4 - IS - Multi-Scale and Computational Scale Bridging IV

Organized by: V.Kouznetsova, J. Schröder and K. Terada

A Recurrent Neural Network-based Surrogate Model for History-Dependent Multi-scale Simulations

L. Wu*, L. Cobian, A. Hössinger-Kalteis, Z. Major, J. Segurado, L. Noels

Numerical homogenization and the Arlequin method

F. Legoll*

A Data-Driven Approach for Multiscale Modelling of Emergent History Effects

W. Abdullah, H. Thomas, G. Marc, K. Varvara, **L. Stainier***

On the proper choice of variational forms in computational homogenization - Scale bridging and global bounds (Online)

K. Carlsson*, F. Larsson, K. Runesson

11:30 - 13:30 (Europe/Madrid), Room VS206

ThM5 - IS - Applications of Computational Methods to Product and Process Design for Industry I

Organized by: T. Iizuka, S. Kajikawa and T. Kuboki

Fracture mechanics evaluation of V-bending die with a hole using parametric analysis system with coupling-matrix-free iterative s-version FEM (Online)

H. Suwa*, Y. Yusa

Effect of contact area on formability in rotary flaring using conical punch with groove

K. Iizuka*, S. Kajikawa, T. Kuboki

Fabrication of a ring groove on tube-inner surface by ironing from outer surface using displacement control of tube bottom end (Online)

I. Junki*, K. Shohei, Y. Akira, G. Akira, O. Katsuyuki, K. Takashi

Finite element analysis of multi-stage deep drawing for forming deep rectangular case with high aspect ratio (Online)

S. Kajikawa*, T. Takasan, T. Kuboki, K. Tamaoki, K. Onishi, A. Gunji, A. Yamauchi

Development of Twisting Method of Sheet Metal using Taper Roll (Online)

K. Avnish*, T. Makiyama, S. Kajikawa, T. Kuboki

A new ductile fracture criterion for skew rolling and its application to evaluate the effect of number of rolls (Online)

K. Yamane*, K. Shimoda, K. Kuroda, S. Kajikawa, T. Kuboki

11:30 - 13:30 (Europe/Madrid), Room VS219

ThM6 - IS - Data-Driven Mechanics for Inelastic Material Behaviours - Recent Advances and Perspectives I

Organized by: S. Reese, L. Stainier, A. Leygue and M. Ortiz

A modular nonlinear stochastic finite element formulation for uncertainty estimation

Y. AMMOUCHE, **A. Jerusalem***

A data-driven finite element computation of polyurethane foam

K. Weinberg*, T. Korzeniowski, S. Buchen

Solver strategies for data-driven computations with inelastic materials (Online)

E. Prume*, R. Eggersmann, M. Ortiz, S. Reese

Unsupervised discovery of plastic yield surfaces

M. Flaschel*, S. Kumar, L. De Lorenzis

A data-driven approach for the classification of elementary shear rearrangements in silica glass (Online)

F. Bamer*, B. Stamm, B. Markert

11:30 - 13:30 (Europe/Madrid), Room VS217

ThM7 - IS - Size Effects in Plasticity and Fracture III

Organized by: E. Martínez-Pañeda, C. Niordson and B. Klusemann

KEYNOTE LECTURE

Size effect in fracture based on the coupled criterion and the phase-field method

G. Molnár*, A. Doitrand, R. Estevez, A. Gravouil

Predicting brittle fracture in elastic-plastic solids undergoing hydrogen embrittlement

P. Kristensen*, C. Niordson, E. Martínez-Pañeda

Phase field Modelling of Environmentally Assisted Fatigue

A. Golahmar*, E. Martínez-Pañeda, C. F. Niordson

On strain energy splits and fracture driving forces in phase field fracture modelling

Y. Navidtehrani*, C. Betegon, E. Martínez-Pañeda

Predicting the dichotomy between ductile and brittle fracture in poly-crystalline samples in the presence of hydrogen

Á. Valverde-González*, A. Quintanas-Corominas, E. Martínez-Pañeda, J. Reinoso Cuevas, M. Paggi

11:30 - 13:30 (Europe/Madrid), Room VS215

ThM8 - IS - Plastic Instability and Fracture in Ductile Materials I

Organized by: A. Srivastava, J. A. Rodríguez-Martínez, S. Osovski

KEYNOTE LECTURE

Localisation of plastic deformation in stretching plates: microstructure effects (Online)

J. Dequiedt*, C. Denoual

Saint venant Principle Near Bifurcation Loads with Implications to Biomechanics (Online)

D. Durban*, N. Blum, B. Karp

Detection and simulation of viscoplastic instabilities in rotating turbine disks (Online) (Online)

N. Guillermin*, S. Forest, J. Besson, M. Maziere

A microstructurally-informed finite element analysis to determine the role of porosity in dynamic localization and fragmentation of additively manufactured metallic materials

M. Marvi Mashhadi *

11:30 - 13:30 (Europe/Madrid), Room Sala de Actos

ThM9 - CS - FEM: Fundamentals and Applications

A Mixed Finite Element Formulation for Elastoplasticity

M. Nagler*, A. Pechstein, A. Humer

A Comparison Between Commercial and Open-Source Software for Finite Element Analysis of Elasto-Plastic Bending (Online) (Online)

A. Abdelaty*, C. Zehetner, C. Reisinger, W. Kunze

Shakedown analysis of 3D frames under multiple load combinations using mixed fiber beam elements

D. Magisano*, L. Leonetti, G. Garcea

On a remarkable geometric-mechanical synerism based on a novel linear eigenvalue problem

J. Kalliauer*, M. Malendowski, H. Mang

Modelling elastoplastic structures under impact using nonsmooth mechanics and optimisation methods

B. Viano*, V. Acary, F. Bourrier

A solid finite element formulation for cables with anisotropic elastoplastic behaviour. (Online)

A. Hildebrandt*

11:30 - 13:30 (Europe/Madrid), Room VS203

ThM10 - CS - Model Reduction and Machine Learning

Data-driven derivation of 1D beam finite elements using domain decomposition and dimensional hyperreduction

A. Giuliadori*, J. Hernández, E. Soudah

Data-driven based prediction model on trabecular bone and 3D remodelling (Online)

Z. Yan*, Z. Liu, Z. Zhuang

Clustering Techniques for Enhanced Reduced Order Model Simulations in Structural Mechanics

J. Bravo Martinez*

An adaptive online strategy for model order reduction applied to non-linear finite element problems (Online)

Y. Özmen*, L. Scheunemann, P. Nigro, J. Schröder

On the prediction of goal oriented error estimate fields in elastic-plastic finite element problems through the use of Gaussian process machine learning (Online)

J. Rouse*, P. Kerfriden

11:30 - 13:30 (Europe/Madrid), Room VS214

ThM11 - IS - Cyclic Plasticity for Soils

Organized by: W. Wu and K. Hashiguchi

KEYNOTE LECTURE

Recent development in rate-dependent hypoplasticity (Online)

W. Wu*, S. Wang

Evaluation of four advanced plasticity and hypoplasticity models in simulating cyclic response of sands (Online)

J. Duque*, M. Yang, W. Fuentes, D. Mašin, M. Taiebat

Description of sand-metal friction behavior by subloading-friction model (Online)

T. Ozaki*, Y. Yamakawa, M. Ueno, K. Hashiguchi

An upgraded bounding-surface plasticity model to properly capture the cyclic behavior of clays.

J. Wang*, G. Xotta, N. De Marchi, V. Salomoni

Elaborated subloading surface model for accurate description of cyclic mobility in granular materials (Online)

Y. Yamakawa*, K. Hashiguchi, T. Mase

Performance of different constitutive soil models: from element tests to the simulation of vibratory pile driving tests (Online)

J. Machacek*, P. Staubach, M. Tafili, H. Zachert, T. Wichtmann

13:30 - 14:30 (Europe/Madrid),

Lunch Break

14:30 - 16:00 (Europe/Madrid), Auditorium

ThA - PL5 - Plenary Session V - M. Bellet and M. Ortiz

Numerical modeling of additive manufacturing: thermomechanical aspects

M. Bellet*

Model-Free Data-Driven Computing: Theory and Practice (ONLINE)

M. Ortiz*

16:00 - 16:30 (Europe/Madrid),

Coffee Break

16:30 - 18:30 (Europe/Madrid), Auditorium

ThA1 - CS - Forming Processes

A comparative study of material hardening models for forming operations and prediction of kinematic hardening by means of an analytical indicator

U. Ahmed*, R. Lafarge, A. Brosius

Numerical modelling of the cutting forces and tool wear in machining processes

J. Carbonell*, J. Conde, O. Fruitos, E. Oñate

Plasticity and Fracture of Powder Bed Fused versus Cast AlSiMg Alloys: Experiments and Computational Modelling

C. Roth, **T. Tancogne-Dejean***, D. Mohr

Numerical and Experimental Modelling of Secondary Phase Precipitation in Casting Duplex Stainless Steels using Dynamic Mode Decomposition

M. Seabra*, J. Cesar de Sa, A. Costa

Numerical Analysis of the Effect of Friction during Forming of Tube with Differential Wall Thickness (Online) (Online)

N. Kawagoshi*, S. Tamura, T. Kawachi

Experimental and Numerical Study of Strength Prediction of Cold forged Parts Based on the Chaboche Combined Hardening Model. (Online)

Y. Shinkai*, O. Kada, R. Nishimura, H. Narumiya, N. Yoshikawa

16:30 - 18:30 (Europe/Madrid), Room VS208

ThA2 - CS - Geomechanics

Transient large heat advection in fractured rock: a zero-thickness interface formulation

A. Perez*, I. Carol, P. Prat

Effect of long-term pore pressure evolution on the integrity of cement plugs of abandoned oil wells in CCS sites

A. Martínez*, J. Liaudat, C. López, I. Carol

A rigorous variant of the shear strength reduction method and its geotechnical applications (Online)

S. Sysala*, E. Hrubesova, Z. Michalec, F. Tschuchnigg

Investigating the Creep Behaviour of Marine Soft Structured Clay by FEM with an Elasto-viscoplastic Constitutive Model. (Online)

J. Mingjing, **W. Christopher Ogutu***, L. Jun

16:30 - 18:30 (Europe/Madrid), Room VS218

ThA3 - CS - Industrial Applications

Solving an inverse problem concerning the sheet metal blank geometry in an industrial application to minimize the processing time (Online) (Online)

S. Mayr*, C. Zehetner, C. Reisinger, W. Kunze

Analysis of PTS fracture loading of NR RPV

G. Galik*

Analysis of the newly developed technique combing grinding with burnishing simultaneously

Y. Charfeddine*, S. Youssef, S. Sghaier, J. Sghaier, H. Hamdi

Material models for highly dynamic metal forming processes (Online) (Online)

F. Katzmayr, C. Reisinger, T. Gross, S. Sieberer, **C. Zehetner***, W. KUNZE, L. WAGNER

Development of a through-process simulation workflow for spiral pipe forming including evolution of texture and dislocation substructure

(Online)

M. Bönisch*, H. Ghiabakloo, M. Seefeldt, A. Van Bael, N. Sanchez, S. Cooreman

Microstructure generation and parameter identification for modeling cyclic behavior of metallic components with graded microstructure

(Online)

J. Kuhn*, P. Sonnweber-Ribic, M. Schneier, T. Böhlke

16:30 - 18:30 (Europe/Madrid), Room VS216

ThA4 - IS - Micromechanics of Ductile Damage

Organized by: C. A. Bronkhorst and M. Ortiz

Microstructure based modeling of shear yielding and crazing induced fracture in amorphous polymers

O. Gültekin*, H. Dal, F. Welschinger

A Non-Local Ductile Failure Model Accounting for Void Growth and Coalescence at Low and High Stress Triaxiality

V. Nguyen, T. Pardoën, **L. Noels***

An FFT framework for simulating non-local ductile failure in heterogeneous materials

M. Magri, S. Lucarini, G. Lemoine, L. Adama, **J. Segurado***

Micromechanics of Ductile Damage during High Triaxiality Loading of a Refractory Metal

C. Bronkhorst*, N. Schmelzer, H. Cho, P. Marcy, S. Vander Wiel, G. Gray

16:30 - 18:30 (Europe/Madrid), Room VS206

ThA5 - IS - Applications of Computational Methods to Product and Process Design for Industry II

Organized by: T. Iizuka, S. Kajikawa and T. Kuboki

3D Finite element model for prediction of the hot rolled strip crown and roll deformation. (Online)

A. Hamdam*, M. Sano, M. Tsugeno, K. Ohara

Effects of Rotational Feed Emulating Four-Die Radial Forging on Forged Shape in Mandrel-Less Incremental Forging of Thick Circular

Tube (Online)

T. Makiyama*

Increasing Precision of Batch Pipe Forming Method Using Burring and Ironing of Large Diameter Steel Pipe in FEM Analysis (Online)

T. Onizuka*, K. Ogawa, S. Nishida

16:30 - 18:30 (Europe/Madrid), Room VS219

ThA6 - IS - Nonlinearities and Irreversible Processes in Solids: Computational Multi-Scale and Multi-Field Approaches

Organized by: T. Böhlke and F. Fritzen

Unified modeling of creep and plasticity

A. Dyck*, A. Kaufmann, M. Heilmaier, T. Böhlke

New adaptive static condensation method for the simulation of large dimensions pre-stressed reinforced concrete structures (Online)

A. Mezher*, L. Jason, G. Folzan, L. Davenne

Modeling of austenitic TRIP-steels at small scales -- mean-field homogenization and simulation of oligo-crystals (Online)

S. Prüger*, B. Kiefer

16:30 - 18:30 (Europe/Madrid), Room VS215

ThA7 - IS - Data-Driven Mechanics for Inelastic Material Behaviours - Recent Advances and Perspectives II

Organized by: S. Reese, L. Stainier, A. Leygue and M. Ortiz

Numerical Model Reduction with Error Estimation for Computational Homogenization of Nonlinear Poroelasticity (Online)

F. Ekre*, F. Larsson, K. Runesson, R. Jänicke

Discovering Sparse and Interpretable Constitutive Laws with Uncertainties

S. Kumar*, M. Flaschel, L. De Lorenzis

A multiscale model-data-driven framework for complex hyperelastic material responses in large deformation

M. Marino*, J. Fuhg, C. Böhm, N. Bouklas, A. Fau, P. Wriggers

Data-driven rate-dependent fracture mechanics (Online)

P. Carrara*, M. Ortiz, L. De Lorenzis

16:30 - 18:30 (Europe/Madrid), Room VS217

ThA8 - IS - Plastic Instability and Fracture in Ductile Materials II

Organized by: A. Srivastava, J. A. Rodríguez-Martínez and S. Osovski

Mutual interactions between the void growth and development of lattice orientation heterogeneity in fcc and hcp single crystals (Online)

S. Virupakshi*, K. Frydrych, K. Kowalczyk-Gajewska

The effect of material orientation on void growth

N. Hosseini, J. Nieto-Fuentes, M. Dakshinamurthy, J. Rodríguez-Martínez, **G. Vaddillo***

On the size-effects in porous metals containing primary and secondary populations of voids

V. Vishwakarma*, K. Nielsen

Dynamic cylindrical cavity expansion: the effect of actual porous microstructure

J. Nieto-Fuentes*, T. Dos Santos, A. Vishnu, M. MARVI MASHHADI, J. Rodríguez-Martínez

A three-pronged approach to predict the effect of plastic orthotropy on the formability of thin sheets subjected to dynamic biaxial stretching

K. N'souglo, N. Jacques, **J. Rodríguez-Martínez***

16:30 - 18:30 (Europe/Madrid), Room Sala de Actos

ThA9 - IS - Size Effects in Plasticity and Fracture IV

Organized by: **E. Martínez-Pañeda, C.Niordson and B. Klusemann**

KEYNOTE LECTURE

Revisiting microscale damage initiation mechanisms in advanced high strength steels (Online)

V. Kouznetsova*, L. Liu, F. Maresca, J. Hoefnagels, T. Vermeij, M. Geers

A thermo-mechanically coupled, gradient extended two-surface damage-plasticity model for large deformations (Online) (Online)

S. Felder*, N. Kopic-Osmanovic, H. Holthusen, T. Brepols, S. Reese

A ductile failure model for porous single crystals (Online)

J. Scherer*, S. Forest, J. Besson, J. Hure, B. Tanguy

Submillimetre constitutive response of single- and poly-crystals (Online)

A. Lodh*, C. Keller, G. Castelluccio

16:30 - 18:30 (Europe/Madrid), Room VS203

ThA10 - IS - New Approaches for Modelling and Identification of Localization Phenomena

Organized by: **K. Naumenko and D. Juhre**

Numerical study on the martensitic phase transformation and fracture behavior with a coupled phase field approach (Online)

D. Juhre*, E. Farahani

Peridynamics analysis of ring bending tests on float glass plates (Online)

K. Naumenko*, M. Pander, M. Würkner

16:30 - 18:30 (Europe/Madrid), Room VS213

ThA11 - IS - A Multi-Scale Perspective of Computational Plasticity

Organized by: **Z. Liu, Y. Cui and Z. Zhuang**

Physics-Based Strategies to Mitigate Lack of Uniqueness of Crystal Plasticity Parameters

D. Dindarlou, A. Ashraf, **G. Castelluccio***

Dislocation Dynamics Modelling of the Creep Behaviour of Particle-Strengthened Materials (Online)

F. Liu*, A. Cocks, E. Tarleton

16:30 - 18:30 (Europe/Madrid), Room VS214

ThA12 - CS - Biomechanics

Effects of Age and Loading Velocity on the Delamination Strength of the Human Aorta

L. Horný*, L. Roubalová, Z. Petřivý, H. Chlup, J. Kronek, P. Tichý, T. Adámek, A. Blanková, T. Suchý

A continuum and computational framework for finite deformation linear viscoelastodynamics (Online)

J. Liu*, M. Latorre, J. Humphrey, A. Marsden

Numerical analysis of the dynamic behaviour of a nonlinear preloaded intervertebral disc (Online)

L. Rouleau*, J. Garcher, J. Deü

20:30 - 22:30 (Europe/Madrid),

Conference Banquet