

BSSM 15th International Conference on Advances in Experimental Mechanics (Sept 7-9th, 2021)

Online BST

Conference Programme

	Tuesday 07th September 2021	
09:15	Conference Link Opens to Delegates	
09:30	Introduction & Welcome (Main Conference Room) Conference Co-Chairs: Hari Arora (Swansea University) and Daniel Mulvihill (University of Glasgow)	
	Conference Room 1	Conference Room 2
	Session 1.1a Chair: Dr Rongxin Zhou	Session 1.1b Chair : Dr Mohammad Fotouhi
	Fatigue and Fracture I	Testing of Composite Materials and Structures
09:40	J-integral analysis of the strain fields of micro-cracks in single silicon crystal using HR-EBSD <u>A. Koko</u> , University of Oxford, UK	Novel Embedded Sensor for Damage Detection and Monitoring In Composite Materials and Adhesively Bonded Joints <u>G. Ólafsson</u> University of Bristol, UK
10:00	Effect of high temperature exposure on the fatigue damage development of X10CrMoVNb9-1 steel for power plant pipes. <u>D. Kukla</u> Polish Academy of Sciences, Poland	Development of a multiaxial test for a wind blade substructure <u>J. Callaghan</u> University of Southampton, UK
10:20	The concept of improving the fracture toughness of double-phase high entropy alloy produced by high-pulse sintering method U-FAST <u>D. Górniewicz</u> Military University of Technology, Poland	Influence of stacking sequence on the open-hole shear strength of composite laminates <u>T. Laux</u> University of Bristol, UK
10:40	Fatigue crack initiation from corrosion pits in sour fluid <u>F. Farhad</u> Northumbria University, UK	Characterisation of damage in composites using acoustic emission and finite element analysis, validated by X-ray computed tomography <u>N. Chandarana</u> University of Manchester, UK
11:00	Break	

	Conference Room 1	Conference Room 2
	Session 1.2a Chair: Dr John Mulvihill	Session 1.2b Chair: Prof. Fabrice Pierron
	Biomechanics & Biomaterials I	Dynamic loading and high strain rate I
11:10	Application of Ultra-high Speed Imaging to Understand Surgical Ultrasonic Cutting <u>A. Marek</u> University of Southampton, UK	Predicting the high strain rate response of natural rubber particulate composites <u>A. Trivedi</u> University of Oxford, UK
11:30	Developing a Precision-cut Tissue Sectioning Protocol for Fresh Porcine Colonic Tissue for Downstream Mechanical Analysis <u>C. McCarthy</u> University of Limerick, Ireland	Improved diagnostics for structural response and impulse transfer in blast experiments <u>G. Langdon</u> University of Sheffield, UK
11:50	Feasibility of a free-fall drop test rig to replicate head impact scenarios in ice hockey <u>D. Haid</u> Sheffield Hallam University, UK	Shock tube testing of deformable structures: A novel experimental set-up <u>K. Brekken</u> Norwegian University of Science and Technology (NTNU), Norway
12:10	Biaxial Creep Behavior of the Apical Vaginal Support in Gilts <u>K. Donaldson</u> Virginia Polytechnic Institute and State University, USA	Thermomechanical Constitutive Response of a Near α Titanium Alloy Over a Wide Range of Strain Rates <u>L. Zhang</u> University of Oxford, UK
12:30	Lunch Break	
13:30	Plenary Session – Main Conference Room Chair: Dr Daniel Mulvihill Microstructure-sensitive fatigue crack nucleation and growth: examples in HPC, BCC and FCC alloys <u>Prof Fionn Dunne FEng, Chair of Micromechanics, Imperial College London, UK</u>	

	Conference Room 1	Conference Room 2
	Session 1.3a Chair: Dr Charchit Kumar	Session 1.3b Chair: Dr Dave Hollis
	Polymers	Digital Image Correlation
14:15	Identification of Hyper-viscoelastic models from one heterogeneous test for elastomers <u>A. Tayeb</u> University of Rennes, France	2D and Stereo Digital Image Correlation Written in MATLAB <u>D. Atkinson</u> Stellenbosch University, South Africa
14:35	Revisiting the deformation mechanisms in rubbers from surface calorimetry-based energy characterization <u>J-B. Le Cam</u> University of Rennes, France	Accurate Strain Field Measurement during Strip Rolling by exploiting Recurring Material Motion in Integrated Digital Image Correlation <u>J. Hoefnagels</u> Eindhoven University of Technology, The Netherlands
14:55	Fabrication of auxetic closed cell foam in a pressure vessel <u>O. Duncan</u> Manchester Metropolitan University, UK	Digital Image Correlation in Monitoring Strain Fields Across Historical Tapestries: Tool for Accuracy Assessment <u>K. Nwanoro</u> Lancaster University, UK
15:15		Improve the finite element predictions by using more accurate material properties obtained from Digital Image Correlation <u>H. Alabdouli</u> Technology innovation institute, United Arab Emirates
15:35	Break	

	Conference Room 1	Conference Room 2
	Session 1.4a Chair: Chris Triantafyllou	Session 1.4b Chair: Dr Geir Olafsson
	Metals & microstructure	Infrared & thermal methods
15:50	Effect of temperature changing rate on phase transformation in magnetic shape memory alloy <u>E. Omotosho</u> Northumbria University, UK	Infrared deflectometry <u>F. Pierron</u> University of Southampton, UK
16:10	Microstructure and damage evolution of Ti6Al4V under fast forming conditions <u>M. Kopec</u> Polish Academy of Sciences, Poland	Assessment of Hot-spots in Structures Using the IR Quasi-Static Method <u>J. Freire</u> Pontifical Catholic University of Rio de Janeiro, Brazil
16:30	Enabling True Stress Strain to Fracture with DIC at Elevated temperatures <u>R. Spencer</u> UK Atomic Energy Authority, UK	Experimental analysis of energy conversion during deformation process based on coupled DIC and IRT results <u>S. Musiał</u> Polish Academy of Sciences, Poland
16:50	Strain rate sensitivity of Zircaloy-4 <u>Y. Liu</u> Imperial College London, UK	Full field vibration measurements on a cantilever beam under impact using visible and infrared deflectometry <u>S. Boubanga</u> Telops Inc.,USA
17:10	Contour Method Residual Stress Uncertainty Evaluation and Sensitivity Analysis: a Friction Stir Welded Plate Case-Study <u>A. Tognan</u> University of Udine, Italy	Evaluation of a low-cost setup for quantitative Thermoelastic Stress Analysis <u>G. Pitarresi</u> University of Palermo, Italy
17:30	Online Social/Networking (move between breakout rooms to chat to colleagues and friends)	
18:30	End of Day 1	

	Wednesday 8th September 2021	
09:15	Conference Link Opens to Delegates	
	Conference Room 1	Conference Room 2
	Session 2.1a Chair: Dr Rongxin Zhou	Session 2.1b Chair: Dr Jason Carson
	Fatigue and Fracture II	Biomaterials & Biomechanics II
09:30	Evaluating the Effect of the Filler Amount on the Crack Growth Behaviour of Rubber and the Strain Distribution in the Vicinity of a Crack <u>H. Mitamura</u> Aoyama Gakuin University, Japan	Spontaneous hydrogel gripper driven by free swelling <u>Z. Qin</u> Northumbria University, UK
09:50	An investigation on the capability of different constraint parameters-- for characterizing in-plane and out-of-plane constraints <u>Z. Chen</u> University of Bristol, UK	Assessment of the Mechanical Properties of Transdermal Devices S. McIntyre Swansea University, UK
10:10	Determination of Small-Specimen Crack Initiation Behaviour in Nuclear Graphite using Combined Full-Field Strain Measurement and Finite Element Simulation <u>M. Jordan</u> National Nuclear Laboratory (NNL), UK	Obtaining the High Strain Rate Properties of Bone Using the Image-Based Inertial Impact (IBII) Test <u>L. Fletcher</u> University of Southampton, UK
10:30	Linking concrete critical length to the mesoscopic structure <u>N. Alanazi</u> University of Sheffield, UK	Mechanical and Structural Characterisation of the Human Meninges <u>J. Mulvihill</u> University of Limerick, Ireland
10:50	Break and EMex 21 Exhibition Please go to Exhibitor Break Out Rooms to speak to exhibitors (there is a separate breakout room for each exhibitor). Exhibitors are: BSSM strain gauge training and certification, Correlated Solutions, Dantec Dynamics, GOM, HBK UK, LaVision UK, Linkham, MatchID, Photron, Quantum Design UK, Specialised Imaging, Techni Measure, Vision Research (Ametek)	

	Conference Room 1	Conference Room 2
	Session 2.2a Chair: Prof. Genevieve Langdon	Session 2.2b Chair: Dr Daniel Mulvihill
	Dynamic loading and high strain rate II	Tribology and Contact I
11:10	The interplay between modelling and experimentation in blast response research <u>E. Pickering</u> University of Sheffield, UK	A round robin friction hysteresis test at Politecnico di Torino and Imperial College London <u>A. Fantetti</u> Imperial College London, UK
11:30	Determination of transient behaviour and spatial impulse distributions of ArmoX 440T plates subjected to explosions in air <u>R. Curry</u> University of Sheffield, UK	Rotary Damper using elastomer particles: Effect on damping torque due to different type of elastomers <u>A. Rakhio</u> Nagoya institute of Technology, Japan
11:50	Mesoscale In-situ Measurement of Deformation and Temperature of an Additively Manufactured Energetic Material Simulant under Dynamic Loading <u>A. Keyhani</u> Exponent Inc. USA	Influence of Asperity Deformation on Linear and Nonlinear Interfacial Stiffness in Dry Rough Surface Contact <u>S. Taghizadeh</u> University of Sheffield, UK
12:10	Hydrothermal Loading Effects on the Dynamic Fracture Behavior of Carbon Fiber Composites <u>L. Lamberson</u> Colorado School of Mines, USA	Repeatability and tailoring of contact stiffness via micro-structured surfaces <u>J. Perris</u> University of Glasgow, UK
12:30	EMex 21 Exhibitor Introductions – Main Conference Room (A 1 min product overview from each of our EMex 21 exhibitors)	
12:50	Lunch and EMex 21 Exhibition Please go to Exhibitor Break Out Rooms to speak to exhibitors (there is a separate breakout room for each exhibitor). Exhibitors are: BSSM strain gauge training and certification, Correlated Solutions, Dantec Dynamics, GOM, HBK UK, LaVision UK, Linkam, Match ID, Photron, Quantum Design, Specialised Imaging, Techni Measure, Vision Research (Ametek).	
	Conference Room 1	Conference Room 2
	Session 2.3a Chair: Dr Hari Arora	Session 2.3b Chair: Dr Daniel Mulvihill

	High Strain Rate behaviour of Composite Materials	Tribology and Contact II
13:50	An investigation into the effect of different patch variables on the impact performance of repaired CFRPs. <u>Z. Hall</u> Imperial College London, UK	Quantitative assessment of real contact area on complex topographies and its role in attachment-detachment mechanisms <u>C. Kumar</u> University of Glasgow, UK
14:10	The Perforation Resistance of Fibre Metal Laminates Subjected to High-velocity Oblique Impact <u>Y. Ding</u> Imperial College London, UK	Isochromatic fringe features for a crack under contact loading <u>G. Ramaswamy</u> Indian Institute of Technology Madras, India
14:30	Transient response and failure of composites containing sustainable materials subjected to air blast <u>S. Gabriel</u> University of Cape Town, South Africa	
14:50	BSSM Young Stress Analyst Competition – Main Conference Room	Co-Chairs: Neha Chandarana and Akash Trivedi
	<ol style="list-style-type: none"> 1. Oscar Brennan (University of Oxford), Extreme Plastic Deformation by High-Pressure Torsion 2. Guanbo Min (University of Glasgow), Origin of the Contact Force-Dependent Response of Triboelectric Nanogenerators 3. Jules Trubert (University of Rennes 1), Surface calorimetry under large deformations of rubbers: a bi-dimensional heat source field reconstruction method in the Lagrangian configuration 4. Hing Ho Janzen Choi (University of New South Wales, Australia) Multi-objective genetic algorithms for material parameter optimisation to predict high-temperature creep behaviour 	
16:10	Break and EMex 21 Exhibition Please go to Exhibitor Break Out Rooms to speak to exhibitors (there is a separate breakout room for each exhibitor). Exhibitors are: BSSM strain gauge training and certification, Correlated Solutions, Dantec Dynamics, GOM, HBK UK, LaVision UK, Linkam, MatchID, Photron, Quantum Design, Specialised Imaging, Techni Measure & Vision Research (Ametek).	
16:30	Plenary Session – Main Conference Room BSSM Measurements Lecture 2021 Martensite-ferrite nano-plasticity and slip transfer unravelled by two-sided high-resolution SEM-DIC and EBSD on isolated interfaces <u>Prof. Johan Hoefnagels, (Editor-in-Chief, Strain) Eindhoven University of Technology, The Netherlands</u>	Chair: Andrew Ramage
17:30	Announcement of YSA Winner and Online Social/Networking Session following the Measurements Lecture (move between breakout rooms to chat to colleagues and friends)	
18:30	End of Day 2	

	Thursday 9th September 2021	
09:15	Conference Link Opens to Delegates	
	Conference Room 1	Conference Room 2
	Session 3.1a Chair: Dr Mohammad Fotouhi	Session 3.1b Chair: Dr Jerry Lord
	Full-Field Imaging Techniques for Composite Materials & Structures	Optical Techniques (DIC, Moire & Photoelastic)
09:30		Extracting the orthotropic stiffness components of bone using DIC and the Virtual Fields Method <u>L. Fletcher</u> University of Southampton, UK
09:50	Assessment of damage in multi-directional laminates using full field imaging <u>R. Ruiz Iglesias</u> University of Bristol, UK	Displacement measurement of concrete bridges by the sampling moiré method <u>R. Shien</u> <u>National Metrology Institute of Japan, Japan</u>
10:10	Failure envelopes based on full field assessment of CFRP subjected to multiaxial loading <u>G. Ólafsson</u> University of Southampton, UK	Rational design of a new reflection photoelastic coating <u>W. Fraser</u> University of Sheffield, UK
10:30	Full-field techniques for validation of numerical models of composite structures; an overview of progress in the CERTTEST project <u>O. Thomsen</u> University of Bristol, UK	
10:50	Break	
11:10	Plenary Session – Main Conference Room	Chair: Dr Hari Arora
	3D Strain measurement in living people using MRI and identification of nonlinear material parameters using the virtual fields method <u>Prof. Sam Evans, Head of School of Engineering, Cardiff University</u>	
12:00	Lunch	
13:00	Plenary Session – Main Conference Room Open Debate: The Future of Experimental Mechanics <u>Panel: Prof. Ole Thybo Thomsen, Prof. Fabrice Pierron, Prof. Johan Hoefnagels & Prof. Genevieve Langdon</u>	Chair: Andrew Ramage
	Conference Room 1	Conference Room 2

	Session 3.2a	Chair : Dr Catrin Davies	Session 3.2b
	Fatigue and Fracture III		Chair: Dr Mehmet Kartal
			Tomography & Digital Volume Correlation
13:50	Digital Image Correlation as an effective tool for fatigue damage monitoring <u>M. Kopec</u> Imperial College London, UK		Self-adaptive digital volume correlation for accurate internal deformation measurements <u>X. Zou</u> Beihang University, China
14:10	Experimental Informed Crack Behaviour Simulation of Ink-jet Printing Carbon Fiber Composites <u>Q. Lu</u> University of Oxford, UK		A multi-purpose, hygro-thermo-mechanical, in-situ x-ray CT tester <u>N. Vonk</u> Eindhoven University of Technology, The Netherlands
14:30	Towards low-cost condition monitoring for crack detection based on thermal emissions <u>K. Amjad</u> University of Liverpool, UK		Towards identification of local material properties of a ductile cast iron using Synchrotron Radiation micro Computed Tomography, Digital Volume Correlation and FE modelling <u>E. Dartfeldt</u> Research Institutes of Sweden (RISE), Sweden
14:50			Microstructural analysis of SiC/SiC composites by X-ray tomography scans of progressive CVI matrix deposition <u>Y. Chen</u> University of Oxford, UK
15:10	Break		
15:20	Plenary Session – Main Conference Room BSSM Best Paper in ‘Strain’ Fylde Prize for 2019 Strain and stress mapping by mechanochemical activation of spiropyran in poly(methyl methacrylate) <u>Prof. Asha-Dee Celestine</u> , Auburn University, USA (https://doi.org/10.1111/str.12310).		Chair: Prof. Johan Hoefnagels
15:40	Plenary Session – Main Conference Room BSSM Best Paper in Strain Fylde Price for 2020 Combined experimental-numerical study on residual stresses induced by a single impact as elementary process of mechanical peening <u>Dr Paul Sandmann</u> , Leuphana University of Luneburg, Germany (https://doi.org/10.1111/str.12338)		Chair: Prof. Johan Hoefnagels
	Conference Room 1		Conference Room 2
	Session 3.3a	Chair: Dr Jason Carson	Session 3.3b
	Model Validation		Chair: Prof. Clive Siviour
			Composites and Polymers

16:00	Data decomposition with Tchebichef moments for validation of computational models <u>H. Vargas</u> Universidad de Alcalá, Spain	An investigation of the interfacial strain transfer of optical fibres embedded in fast curing epoxy resins. <u>B. Seers</u> University of Sheffield, UK
16:20	Finite element modelling validation of fibre orientation inversion in CFRP using high-frequency eddy-current testing <u>Q. Yi</u> University of Bristol, UK	Machine learning tools for predicting mechanical properties of elastomers. <u>G. Delahaye</u> Université de Rennes, France
16:40	Validation of an FE Model for Lethality Prediction of PBLI Using an Additive Manufactured ATD <u>D.A. Howells</u> Swansea University, UK	A Digital Image Correlation (DIC) - based technique for measuring Chemical Cure Shrinkage (CCS) evolution <u>J. McArdle</u> University of Bristol, UK
17:00	An optimisation-based technique for predicting strains in defective composite laminates <u>X. Li</u> University of Liverpool, UK	Investigation of interfacial behaviour of single glass fibre/matrix composites by using single glass fibre fragmentation test <u>Y. Cao</u> University of Glasgow, UK
17:20	Closing Plenary Session – Main Conference Room Conference Co-Chairs: Hari Arora & Daniel Mulvihill Announcement of 2022 Conference Chair (Prof. James Marrow, University of Oxford)	
17:30	Conference close	