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Naveed, Nida, Hosseinzadeh, F, Kowal, J and Bouchard, PJ (2017) Residual stress characterisation of a dissimilar metal electron beam welded plate using the contour method. In: BSSM 12th International Conference on Advances in Experimental Mechanics, 29th August 2017- 31st August 2017, University of Sheffield, Sheffield, UK.

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**BSSM 12<sup>th</sup> International Conference on Advances in Experimental Mechanics,**

**The Diamond, University of Sheffield, Sheffield, UK, 29-31 August 2017,**

**FINAL PROGRAMME**

<b>08:00</b>	Tuesday 29th August 2017 <b>Registration – The Foyer The Diamond</b>		
<b>09:30</b>	<b>Introduction &amp; Welcome – Lecture Theatre 5</b> <b>Conference Chair: Dr Rachel Tomlinson, The University of Sheffield</b>		
	<b>Lecture Theatre 5</b>	<b>Lecture Theatre 6</b>	<b>Lecture Theatre 7</b>
	<b>Session 1.1a</b> <b>Chair: I.Antoniadou</b>	<b>Session 1.1b</b> <b>Chair: C.Smith</b>	<b>Session 1.1c</b> <b>Chair: H.Ghadbeigi</b>
	<b>Dynamic and Vibrational Loading</b>	<b>Applications</b>	<b>Fracture Mechanics</b>
<b>09:45</b>	107. Measurement of Torsional Vibration of Drill-String, V. Vaziri, M. Kapitaniak and M. Wiercigroch, Centre for Applied Dynamic Research, University of Aberdeen, Scotland, UK	3. The Effect of Short Range Order on the Thermal Output and Gage Factor of Ni3FeCr Strain Gages, T. P. Kieffer <sup>1,2</sup> and K. J. Peters <sup>2</sup> , <sup>1</sup> Vishay Precision Group – Micro-Measurements, USA, <sup>2</sup> North Carolina State University, USA	28. Static Strength of aluminium-to-steel thin welded joints: preliminary results, I. Al Zamzamia, J. B. Davison and L. Susmel University of Sheffield, UK
<b>10:05</b>	84. Dynamic characterisation of piezoelectric thick film sensors embedded within dissimilar material joints, A Deligiannia, J M Hale School of Mechanical & Systems Engineering, University of Newcastle upon Tyne, UK	17. Experimental characterization of dielectric elastomer actuator, R. Zhang, P.Iravani and P. Keogh, University of Bath, UK	34. Effect of sample edge-plastic zone proximity on Crack Tip Opening Angle, D. T. Asquith and V.P. Pasialis Sheffield Hallam University, UK
<b>10:25</b>	46. Meso-scale strain measurement of heterogeneous materials under dynamic loading, S. Ravindran, A. Kidane, Department of Mechanical Engineering, University of South Carolina, USA	102. Investigating the Mechanical Properties of Case Carburised Steels, D. Griffiths, A. Clarke, H.P. Evans, S. Evans, R. Pullin, Cardiff University, Wales, UK	43. Additively manufactured PLA: strength and fracture behaviour under static loading, A.A. Ahmed and L. Susmel, The University of Sheffield, UK
<b>10:45</b>	109. Measurement of Lateral Vibration of BHA, M. Kapitaniak, V. Vaziriand M. Wiercigroch Centre for Applied Dynamic Research, University of Aberdeen, Scotland, UK		120. Effects of Unloading Rate and Relaxation on Elastic-plastic Resistance Curve Tests, P.B.S. Bailey, Instron Dynamic Systems, UK
<b>11:05</b>	<b>Refreshments – Diamond Lower Ground Floor Lobby</b>		

	<b>Lecture Theatre 5</b>	<b>Lecture Theatre 6</b>	<b>Lecture Theatre 7</b>
	<b>Session 1.2a</b> <b>Chair: S.Quinn</b>	<b>Session 1.2b</b> <b>Chair: R.Tighe</b>	<b>Session 1.2c</b> <b>Chair: G.Tozzi</b>
	<b>Optical Methods</b>	<b>Composites</b>	<b>Experimental Biomechanics 1</b>
<b>11:30</b>	121. Implementation of a novel apparatus to perform a Photoelastic Tomography analysis, S. Abrego, R. A. Tomlinson, The University of Sheffield, UK	89. Mechanical properties of PLA based films for food packaging, N.F. Wang, Newcastle University, UK	54. Additive manufacturing of mechanomimetic bone structures, R. Parwani, M. Curto, A. P. Kao, M. Pani, G. Tozzi and A. H. Barber, University of Portsmouth, UK
<b>11:50</b>	29. Deflectometry as a full-field NDT tool, F. Pierron, C. Devivier, and R. Seghir, University of Southampton, UK	78. Indicating Coatings for CFRP composites in Aeronautic, S. Senani <sup>1</sup> , L. Rozes <sup>2</sup> , Q. Morelle <sup>2</sup> , M. Gaudon <sup>3</sup> , E. Duguet <sup>3</sup> , E. le Bourhis <sup>4</sup> , S. Barut <sup>1</sup> , S. Guinard <sup>1</sup> , F. Touchard <sup>4</sup> , J.-F. Letard <sup>5</sup> , P.-J. Lathierre <sup>6</sup> , <sup>1</sup> Airbus Group Innovations, Suresnes, France, <sup>2</sup> Université UPMC – LCMCP, Paris, France, <sup>3</sup> ICMCB Université de Bordeaux, France, <sup>4</sup> Université de Poitiers, France, <sup>5</sup> OliKrom, Pessac, France, <sup>6</sup> MAPAERO Pamiers, France	83. Quantification of Morphological Parameters of Forearm Skin Layers using OCT with Circumstances Involving Dressing Tape, R. Maiti <sup>1</sup> , L.-C. Gerhardt <sup>2</sup> , Z.S. Lee <sup>1</sup> , S.E. Franklin <sup>2</sup> , R. Lewis <sup>1</sup> , S.J. Matcher <sup>3</sup> and M.J. Carré <sup>1</sup> ; <sup>1</sup> Dept of Mechanical Engineering, University of Sheffield, UK; <sup>2</sup> Philips Research, High Tech Campus, Eindhoven, The Netherlands; <sup>3</sup> Dept of Electrical and Electronic Engineering, University of Sheffield, UK
<b>12:10</b>	52. Aerodynamic surface Pressure Measurement using Deflectometry, R. Kaufmann, F. Pierron and B. Ganapathisubramani, University of Southampton, UK	114. Evaluation of Mechanical Properties Through the Non-destructive Test in Polymer Composites Reinforced by Natural Jute Fibers, J. S. S. Neto, R. A. A. Lima, D. K. K. Cavalcanti, J.P.B. Souza, H.R.M. Costa, R.A. Aguiar Centro Federal de Educação Tecnológica Rio de Janeiro, Brazil	20. Validation of local displacement predictions of Micro-FE models of trabecular bone and vertebral bodies by Digital Volume Correlation, E. Dall'Ara <sup>1</sup> , M.C. Costa <sup>1</sup> , G. Tozzi <sup>2</sup> and M. Viceconti <sup>1</sup> ; <sup>1</sup> University of Sheffield, UK; <sup>2</sup> University of Portsmouth, UK
<b>12:30</b>	86. Topography of hidden objects revealed using THz digital holography, E. Hack, L. Valzania and P. Zolliker, EMPA, Switzerland	12. Validating Finite Element Models of Composite Structures Containing Fibre-Waviness Defects; W. J. R. Christian <sup>1</sup> , F. A. DiazDelao <sup>1</sup> , E. A. Patterson <sup>1</sup> and K. Atherton <sup>2</sup> ; <sup>1</sup> School of Engineering, University of Liverpool, UK; <sup>2</sup> Airbus Operations Ltd., Bristol, UK	116. Developing a soft tissue surrogate for use in photoelastic testing, S. Falconer, Z. Taylor and R. Tomlinson, The University of Sheffield, UK
<b>12:50</b>	113. A combined full-field imaging and metallography approach to assess the local properties of friction stir welded (FSW) copper-stainless steel joints, S. Ramachandran <sup>1</sup> , J.M. Dulieu-Barton <sup>1</sup> , P.A.S. Reed <sup>1</sup> , A.K.Lakshminarayanan <sup>2</sup> , <sup>1</sup> University of Southampton, UK, <sup>2</sup> SSN College of Engineering, India	26. Design of a photomechanical test to measure the high strain rate through-thickness tensile strength of composites, J. Van Blitterswyk, L. Fletcher and F. Pierron, University of Southampton, UK	76. Possible age-related changes in the mechanical properties of tendons of mimecan-deficient mice, K. L. Goh, Newcastle University International Singapore

<b>13:10</b>	<b>Lunch – Diamond Lower Ground Floor Lobby</b>		
<b>14:10</b>	<b>Plenary Session - Lecture Theatre 5</b> <b>Linking Length Scales: Investigating the Effect of Microscale Strain Localization on Macroscopic Response,</b> <b>Professor Sam Daly, University of California at Santa Barbara, USA</b>		<b>Chair R.Tomlinson</b>
<b>15:10</b>	<b>Refreshments – Diamond Lower Ground Floor Lobby</b>		
	<b>Lecture Theatre 5</b>	<b>Lecture Theatre 6</b>	<b>Lecture Theatre 7</b>
	<b>Session 1.3a</b> <b>Chair: J. Hoefnagels</b>	<b>Session 1.3b</b> <b>Chair: R. Tomlinson</b>	<b>Session 1.3c</b> <b>Chair: H.Ghadbeigi</b>
	<b>Strain Measurement at the Microscale 1</b>	<b>Infrared Thermography</b>	<b>Digital Image Correlation 1</b>
<b>15:35</b>	32. In situ $\mu$ -DIC measurements of strain partitioning in medium Mn steel, A. Dutta <sup>1</sup> , D.Ponge <sup>1</sup> , S. Sandlöbes <sup>2</sup> , D. Raabe <sup>1</sup> , <sup>1</sup> Max-Planck-Institut für Eisenforschung, Germany, <sup>2</sup> Institut für Metallkunde und Metallphysik, RWTH Aachen, Germany	45. Fatigue Limit Assessment of a Low Carbon Steel using Dixon's Up-And-Down and Infrared Thermography Methods, M.V. Guamán A., J.T.P. Castro, R.B. Vieira, V.E.L. Paiva, and J.L.F. Freire, Pontifical Catholic University of Rio de Janeiro, Brazil	5. Analysis of the effectiveness of cold expansion in multi-layer stacks using digital image correlation, K. Amjad <sup>1,2</sup> , E.A. Patterson <sup>1</sup> and W.C. Wang <sup>2</sup> <sup>1</sup> University of Liverpool, UK; <sup>2</sup> National Tsing Hua University, Taiwan
<b>15:55</b>	44. High accuracy in micro-mechanical deformation measurements: Eliminating SEM artifact-induced errors, S. Maraghechi, J.Hoefnagels, R. Peerlings, M.Geers, Eindhoven University of Technology, Netherlands	73. Thermal approach for evaluating the heat dissipated at the crack tip, D. Palumbo, R. De Finis, F. Ancona, U. Galietti, Politecnico di Bari, Italy	55. A characterisation of bicycle powertrain losses due to chainring deflection, Thomas Davis and David Asquith, Sheffield Hallam University, UK
<b>16:15</b>	11. Crystal deformation and rotation measurements in bainitic-ferritic steel Q. Shi <sup>ab</sup> , F. Latourte <sup>a</sup> , F. Hild <sup>b</sup> , S. Roux <sup>b</sup> <sup>a</sup> EDF R&D, France, <sup>b</sup> Université Paris Saclay, France	30. The study of energy dissipation at crack tip using infrared thermography coupled with contact heat source sensor. A. Vshivkov, A. Iziumova and O. Plekhova, ICMM UB RAS, Russia	101. Assessment of the elongational properties of HIPS membranes based on full-field strain measurements during positive thermoforming A.Ayadi <sup>1,2</sup> , M.F.Lacrampe <sup>1,2</sup> , and P.Krawczak <sup>1,2</sup> , IMT Lille Douai, Institut Mines-Télécom, France. <sup>2</sup> Université de Lille, France.
<b>16:35</b>	48. Coupled experimental-numerical Analysis of strain partitioning in metallic microstructures: The importance of Considering the 3D Morphology, M. Diehl, D. Yan, L. Morsdorf, D. An, C.C. Tasan, S. Zaeferrer, F. Roters, D. Raabe, Max-Planck-Institut für Eisenforschung GmbH, Germany	96. The Effect of Microstructure on the Dissipative Heat Source in 316L Stainless Steel, P.J. Seelan, J.M. Dulieu-Barton, F. Pierron, University of Southampton, UK	118. Strain Measurement on Anti-G Garments using 3D Digital Image Correlation, J. C. Chamberlin and E. A. Patterson, University of Liverpool, UK
<b>16:55</b>		8. Infrared Imaging for Material Characterization in Fracture Mechanics Experiments, M.-A. Gagnon, F. Marcotte, P. Lagueux and E. Guyot, Telops, Canada	77. Dynamic Analysis using Fringe Projection and Digital Image Correlation, L. Felipe-Sesé, A. Molina-Viedma, E. López-Díaz, E. López-Alba, F.A Díaz Universidad de Jaén, Spain
<b>17:15</b>	<b>BSSM AGM – Lecture Theatre 5</b>		
<b>18:00</b>	<b>18:00 Informal Reception and Tours of the Diamond Building</b>		<b>Diamond Building: First Floor Structures &amp; Dynamics Laboratory</b>

	<b>Wednesday 30th August 2017</b>	
	<b>Lecture Theatre 5</b>	<b>Lecture Theatre 6</b>
	<b>Session 2.1a</b> <span style="float: right;"><b>Chair S.Daly</b></span>	<b>Session 2.1b</b> <span style="float: right;"><b>Chair: J.Freire</b></span>
<b>09:00</b>	<b>Strain Measurement at the Microscale 2</b>	<b>IR and Thermoelastic Methods</b>
<b>09:00</b>	67. Ferrite slip system activation investigated by uniaxial micro- tensile tests, J.P.M. Hoefnagels, C. Du, F. Maresca, and M.G.D. Geers, Eindhoven University of Technology, The Netherlands	14. Crack Tip Plastic Zone Measurement in Austenitic Stainless Steel Using Thermoelastic Stress Analysis R. P. Spencer and E. A. Patterson, University of Liverpool, UK
<b>09:20</b>	69. Local stress fields induced by twinning in $\beta$ -metastable titanium alloys, F.X. Lin <sup>1</sup> , M. Marteleur <sup>1</sup> , J. Alkorta <sup>2</sup> , P.J. Jacques <sup>1</sup> and L. Delannay <sup>1</sup> <sup>1</sup> Université Catholique de Louvain, Belgium, <sup>2</sup> CEIT San Sebastian, Spain	65. Capability of the thermoelastic phase analysis method for studying damage evolution of GFRP composites D. Palumbo , R. De Finis and U. Galietti, Politecnico di Bari, Italy
<b>09:40</b>	25. Quantitative estimation of spatial stress gradients from dislocation pile-up at grain boundaries in commercially pure titanium; I. Basu, V. Ocelík, J.Th.M De Hosson; University of Groningen, The Netherlands	63. Automated crack tip tracking in stainless steel specimens using thermoelastic stress analysis, C. A. Middleton <sup>1</sup> , A. Gaio <sup>1,2</sup> , R. J. Greene <sup>2</sup> , R. P. Spencer <sup>1</sup> and , E. A. Patterson <sup>1</sup> , University of Liverpool, U.K. <sup>2</sup> Strain Solutions Ltd, U.K.
<b>10:00</b>	57. Very High Resolution Micromechanical Measurements on Thin Wires in Torsion W. Ali <sup>1,2</sup> , D.J. Dunstan <sup>1</sup> and A.J. Bushby <sup>1</sup> <sup>1</sup> Queen Mary University of London, U.K., <sup>2</sup> Government College University, Lahore, Pakistan	111. Monitoring and characterising the infrared temperature evolution of metallic SENT specimens for test machine control, J. Thatcher <sup>1</sup> , D.A. Crump <sup>1</sup> , P.B.S. Bailey <sup>2</sup> , J.M. Dulieu-Barton <sup>1</sup> . <sup>1</sup> University of Southampton, UK, <sup>2</sup> Instron Dynamic Systems, Instron Division of ITW Ltd., UK
<b>10:20</b>	<b>Plenary Session: Lecture Theatre 5</b> <b>BSSM Best Paper in 'Strain' Fylde Prize for 2016.</b> <b>The Grid Method for In-plane Displacement and Strain Measurement: A Review and Analysis. M.Grédiac, F.Sur and B. Blaysat</b> <b>Professor Michel Grédiac, L'Université Blaise Pascal, Clermont-Ferrand, France</b>	<b>Chair F.Pierron</b>
<b>10:50</b>	<b>Exhibitor Introductions</b>	
<b>11:10</b>	<b>Refreshments and Exhibition – Workrooms 1 &amp; 2</b>	

	<b>Lecture Theatre 5</b>	<b>Lecture Theatre 6</b>
	<b>Session 2.2a</b>	<b>Session 2.2b</b>
	<b>Chair: R.Pullin</b>	<b>Chair: J.Barton</b>
	<b>Acoustic Emission</b>	<b>Digital Image Correlation 2</b>
<b>11:40</b>	97. Fatigue Crack Monitoring Using an Additive Wave Analysis: a Hits Based Approach to Wavestreaming with Acoustic Emission, J.P. McCrory, M.R. Pearson and R. Pullin, Cardiff University, Wales, UK	87. Establishing a one-to-one relationship between FEA and DIC: pitfalls and solutions, P. Lava <sup>1</sup> , F. Pierron <sup>2</sup> , L. Wittevrongel <sup>1</sup> , D. Debruyne <sup>3</sup> , <sup>1</sup> MatchID – Metrology beyond colors, Belgium, <sup>2</sup> University of Southampton, UK, <sup>3</sup> University of Leuven, Belgium
<b>12:00</b>	24. Relationship between acoustic emission distribution and stress variation through the depth of reinforced concrete beam cross sections, Liu Simeng <sup>1</sup> , Wang Yu <sup>2</sup> , Matthew R. Pearson <sup>2</sup> , Mark Eaton <sup>2</sup> and Rhys Pullin <sup>2</sup> , <sup>1</sup> School of Civil Engineering, Chongqing Jiaotong University, Chongqing, P.R.China, <sup>2</sup> Cardiff University, Wales, UK	105. Deformation Behaviour and Damage Formation in DP1000 at Different Scales using Digital Image Correlation, N. I. Rohaizat <sup>1</sup> , C. Pinna <sup>1</sup> , H. Ghadbeigi <sup>1</sup> and D. Hanlon <sup>2</sup> <sup>1</sup> University of Sheffield, UK, <sup>2</sup> Tata Steel IJmuiden, The Netherlands
<b>12:20</b>	103. Use of Acoustic Emission to Determine the Lubrication Conditions in Simulated Gear Contacts, S.H. Hutt, A. Clarke, H.P Evans and R. Pullin, Cardiff University, Wales, UK	119. Failure analysis of spot welds in Advanced High Strength Steels, H. Ghadbeigi <sup>1</sup> , H.L. Collicott <sup>1</sup> , F. Yu <sup>1</sup> , D. Norman <sup>2</sup> and E. van der Aa <sup>3</sup> , <sup>1</sup> The University of Sheffield, UK, <sup>2</sup> Tata Steel R&D, Warwick, UK <sup>3</sup> Tata Steel R&D, IJmuiden, The Netherlands
<b>12:40</b>		71. Assessment of Damage Progression in 3D Woven Carbon-Epoxy Composites Subjected to Out-Of-Plane Loading using Digital Image Correlation, D. Panchal and P.R. Cunningham, Loughborough University, UK
<b>13:00</b>	<b>Lunch and Exhibition - Workrooms 1 &amp; 2</b>	

	<b>Lecture Theatre 5</b>	<b>Lecture Theatre 6</b>
	<b>Session 2.3a</b> <span style="float: right;"><b>Chair: F.Pierron</b></span>	<b>Session 2.3b</b> <span style="float: right;"><b>Chair: D.Asquith</b></span>
	<b>High Speed Strain Measurement</b>	<b>Fatigue Analysis</b>
<b>14:00</b>	35. A Novel Photomechanical Approach for Measuring Dynamic Fracture Toughness, L. Fletcher <sup>1</sup> , S. Pagano <sup>2</sup> , L. Lamberson <sup>2</sup> and F. Pierron <sup>1</sup> , <sup>1</sup> University of Southampton, UK, <sup>2</sup> Drexel University, Philadelphia, USA	60. Fatigue crack initiation in Waspaloy under biaxial loading, J.V. Sahadi, D. Nowell and R.J.H. Paynter, University of Oxford, UK
<b>14:20</b>	37. Application of digital image correlation and high speed photography to determine the fibre failure fracture toughness of composites under high rate loading, P. Kuhn <sup>1</sup> , J. Xavier <sup>2,3</sup> , G. Catalanotti <sup>4</sup> , P.P. Camanho <sup>5</sup> and H. Koerber <sup>1</sup> <sup>1</sup> Technische Universität München, Germany, <sup>2</sup> INEGI, Institute of Science and Innovation in Mechanical and Industrial Engineering, Portugal, <sup>3</sup> CITAB, University of Trás-os-Montes e Alto Douro, Portugal, <sup>4</sup> Queen's University Belfast, UK, <sup>5</sup> Universidade do Porto, Portugal	9. Overload and failure of wind turbine gearbox bearings, A. Reid <sup>1</sup> , I. Martinez <sup>1</sup> , M Mostafavi <sup>2</sup> , I. Antoniadou <sup>1</sup> and M. Marshall <sup>1</sup> ; <sup>1</sup> The University of Sheffield, <sup>2</sup> University of Bristol, UK
<b>14:40</b>	74. High speed 3D digital image correlation for experimental modal analysis during base motion excitation Á. J. Molina-Viedma , E. López-Alba, L. Felipe-Sesé, F.A Díaz, Universidad de Jaén, Spain	92. Characterisation and fatigue life assessment of handling surface damage, R.M.N. Fleury, E. Salvati, D. Nowell and A.M. Korsunsky University of Oxford, UK

<b>15:00</b>	<b>BSSM Young Stress Analyst Competition Lecture Theatre 5</b> <span style="float: right;"><b>Chair: R.Tighe</b></span>
	Elise Chevallier, University of Southampton ‘The Influence of Grain Size on the Assessment of Welding Induced Plasticity using Thermoelastic Stress Analysis’ Marta Pena Fernandez, University of Portsmouth, ‘Micromechanics and DVC of in vivo bonebiomaterial systems’ Matthew Molteno, Stellenbosh University, ‘Stabilised Measurement of the J-integral from Digital Volume Correlation Data’ William LePage, University of Michigan, ‘Multiscale Experimental Investigation of Fatigue Cracks in Nanocrystalline NiTi’
<b>16:10</b>	<b>Refreshments and Exhibition - Workrooms 1 &amp; 2</b>
<b>16:30</b>	<b>BSSM Measurements Lecture - Lecture Theatre 5</b> <span style="float: right;"><b>Chair: S.Gungor</b></span> Experimental characterisations of devices for high power ultrasonics applications Professor Margaret Lucas, University of Glasgow, UK
<b>19:00</b>	<b>Conference Dinner</b> – Coaches depart from The Edge for Kelham Island Industrial Museum at 18.45 and The Diamond (Broad Lane) at 18.55



	<b>Thursday 31st August 2017</b>		
	<b>Lecture Theatre 5</b>	<b>Lecture Theatre 6</b>	<b>Lecture Theatre 7</b>
	<b>Session 3.1a</b> <b>Chair: S.Gungor</b>	<b>Session 3.1b</b> <b>Chair: F.A Díaz Garrido</b>	<b>Session 3.1c</b> <b>Chair: R.Pullin</b>
	<b>High Temperature Strain Analysis</b>	<b>Residual Stress Measurements</b>	<b>NDT using Acoustic Emissions</b>
<b>09:00</b>	22. Acoustic response of thermally stressed plates using a temperature dependent finite element material model, C. Santos Silva, C.M. Sebastian and E.A. Patterson, University of Liverpool, UK	85. Application of finite element simulation in the feasibility study of in-core residual stress measurement within graphite moderator bricks using deep-hole drilling technique, S. Hossain <sup>1,2</sup> , X Ficquet <sup>3</sup> , E.J. Kingston <sup>3</sup> , <sup>1</sup> University of Bristol, UK, <sup>2</sup> Military Technological College, Oman <sup>3</sup> VEQTER Ltd, Bristol, UK	41. Early damage detection in composites by distributed strain and acoustic event monitoring, N. Chandarana, D. M. Sanchez, C. Soutis and M. Gresil, The University of Manchester, UK
<b>09:20</b>	64. A Combined Experimental and Modelling Approach to Examine the Microstructural Deformation Experienced in Ex-Service 9Cr-1Mo Steel at Elevated Temperatures, E.D. Meade, F. Sun, N.P. O’Dowd, P. Tiernan , University of Limerick, Ireland	95. Residual Stresses in Ti-6Al-4V Parts Manufactured by Direct Metal Laser Sintering and Electron Beam Melting, G. Lim, K. Lau, W.S. Cheng, Z. Chiang, M. Krishnan and D. T. Ardi, Advanced Remanufacturing and Technology Centre (ARTC), Singapore	99. Active Learning Applications to Acoustic Emission Data, L. Bull, K. Worden, N. Dervilis, University of Sheffield, UK
<b>09:40</b>	98. Characterising Creep Damage Directly from Digital Image Correlation Displacement Data, M. van Rooyen and T.H. Becker, Stellenbosch University, South Africa	106. Uncertainties in complex weld induced residual stresses, S. Hossain <sup>1,2</sup> , G. Zheng <sup>1,3</sup> , D. Goudar <sup>4</sup> , X Ficquet <sup>5</sup> , E.J. Kingston <sup>5</sup> , <sup>1</sup> University of Bristol, UK, <sup>2</sup> Military Technological College, Oman, <sup>3</sup> State Power Investment Corporation Research Institute, Beijing, China, <sup>4</sup> WS Atkins, UK, <sup>5</sup> VEQTER Ltd, Bristol, UK	61. Damage detection of a composite bearing liner using Acoustic Emission. K. Karras, R. Pullin, R.I. Grosvenor, A. Clarke. Cardiff University, Wales, UK
<b>10:00</b>	100. Determination of creep properties from a single specimen using DIC, E. Muyupa, S. Gungor, A. N. Forsey and P. J. Bouchard, The Open University, UK	4. Residual stress prediction in dissimilar metal electron beam welded plate using the contour method, N. Naveed <sup>1,2</sup> , F. Hosseinzadeh <sup>2</sup> , J. Kowal <sup>2</sup> , P.J. Bouchard <sup>2</sup> , <sup>1</sup> University of Sunderland, <sup>2</sup> The Open University, UK	75. Tool wear prediction and damage detection in milling using dynamic Bayesian networks, N. Ray, K. Worden, S. Turner, J-P. Villain-Chastre <sup>1</sup> , E.J. Cross, The University of Sheffield, UK, <sup>1</sup> Messier-Bugatti-Dowty, UK
<b>10:20</b>	<b>Refreshments – Diamond Lower Ground Floor Lobby</b>		
<b>10:45</b>	<b>Plenary Session- Lecture Theatre 5</b> <b>Credibility in computational biology based on experimental mechanics</b> <b>Professor Eann Patterson, University of Liverpool, UK</b>		<b>Chair R.Tomlinson</b>

	Lecture Theatre 5	Lecture Theatre 6	Lecture Theatre 7
11:50	Session 3.2a Chair: E.Patterson	Session 3.2b Chair: R.Tomlinson	Session 3.2c Chair: D.Nowell
11:50	<b>Computational Modelling and Validation</b>	<b>Volumetric Strain Measurements</b>	<b>Contact Mechanics</b>
11:50	33. On the Numerical Modelling of Local Stress-Strain Sequences under Complex Constant/Variable Amplitude Fatigue Loading N. Zuhair Faruq and L. Susmel, The University of Sheffield, UK	122. Crack characterization in a Metal Matrix Composite with 3D Phase Congruency and Digital Volume Correlation, A.F.Cinar <sup>1</sup> , D. Hollis <sup>2</sup> , R.A. Tomlinson <sup>1</sup> , C. Reinhard <sup>3</sup> , T Connolley <sup>3</sup> , T.J. Marrow <sup>4</sup> , M.Mostafavi <sup>5</sup> ; <sup>1</sup> University of Sheffield, <sup>2</sup> LaVision UK, <sup>3</sup> Diamond Light Source, <sup>4</sup> University of Oxford, <sup>5</sup> University of Bristol, UK	13. Experimental observations on the friction of textile fibres relevant to carbon fibre composite forming, D. M. Mulvihill <sup>1,2</sup> , O. Smerdova <sup>3</sup> , M.P.F. Sutcliffe <sup>2</sup> ; <sup>1</sup> School of Engineering, University of Glasgow, UK; <sup>2</sup> Department of Engineering, University of Cambridge, UK <sup>3</sup> Université de Poitiers, France
12:10	51. Application of a frequentist metric for the validation of computational mechanics models. K. Dvurecenska <sup>1</sup> , E. Patelli <sup>1</sup> , S. Graham <sup>2</sup> and E.A. Patterson <sup>1</sup> , <sup>1</sup> The University of Liverpool, UK, <sup>2</sup> National Nuclear Laboratory, Warrington, UK	40. The effect of voxel size and signal-to-noise ratio on the measurement uncertainties of a global Digital Volume Correlation approach, M. Palanca <sup>1</sup> , A.J. Bodey <sup>2</sup> , M. Giorgi <sup>3</sup> , M. Viceconti <sup>4</sup> , D. Lacroix <sup>4</sup> , L. Cristofolini <sup>1</sup> , E. Dall'Ara <sup>3</sup> , <sup>1</sup> Università di Bologna, Italy; <sup>2</sup> Diamond Light Source, Oxford, UK <sup>3</sup> Dept of Oncology and Metabolism and INSIGNEO, University of Sheffield, <sup>4</sup> Dept of Mech Eng and INSIGNEO, University of Sheffield, UK	59. Measuring Contact Stiffness, R.J.H. Paynter, K. Parel and D. Nowell, University of Oxford, UK
12:30	82. Numerical simulation and design tool for an oil pipe centralizer: A case study of a cost driven adaptation by an SME, A.M. Hedayetullah <sup>1</sup> , R. Fletcher <sup>2</sup> , E. James <sup>2</sup> , P.A. Flay <sup>2</sup> , G. R. Tabor <sup>1</sup> and C. W. Smith <sup>1</sup> , <sup>1</sup> University of Exeter, UK. <sup>2</sup> Centek Ltd, Newton Abbot, UK.	49. Effect of SR-microCT exposure time on the damage induced on trabecular bone using digital volume correlation, M. Peña Fernández <sup>1</sup> , R. Parwani <sup>1</sup> , A J Bodey <sup>2</sup> , E. Dall'Ara <sup>3</sup> , G. Blunn <sup>4</sup> , A. Barber <sup>1</sup> , G. Tozzi <sup>1</sup> , <sup>1</sup> University of Portsmouth, UK; <sup>2</sup> Diamond Light Source, UK; <sup>3</sup> University of Sheffield, UK; <sup>4</sup> University College London, UK	90. DIC measurements for friction interface motion monitoring L. Pesaresi <sup>1</sup> , V. Ruffini <sup>1</sup> , M. Stender <sup>2</sup> , and C.W. Schwingshackl <sup>1</sup> , <sup>1</sup> Imperial College London, UK; <sup>2</sup> Hamburg University of Technology, Germany
12:50	27. Quantitative strain measurement on artwork by a combination of shearography and FEM-simulation, D. Buchta <sup>1</sup> , C. Heinemann <sup>2</sup> , G. Pedrini <sup>1</sup> , C. Krekel <sup>2</sup> , W. Osten <sup>1</sup> , <sup>1</sup> University of Stuttgart, <sup>2</sup> Staatliche Akademie der Bildenden Künste, Stuttgart, Germany	115. Quantification of damage in alveolar morphology in post-blast lung using synchrotron micro-CT; K. Vitharana <sup>1,2</sup> , J. Sherwood <sup>2</sup> , T-T Nguyen <sup>3</sup> , A. J. Bodey <sup>4</sup> , A. Karunaratne <sup>2,5</sup> and H. Arora <sup>1,2</sup> ; <sup>1</sup> The Royal British Legion Centre for Blast Injury Studies, UK; <sup>2</sup> Dept. Bioengineering, Imperial College London; <sup>3</sup> Dept. Physics, Imperial College London; <sup>4</sup> Diamond Light Source Ltd, UK; <sup>5</sup> University of Moratuwa, Sri Lanka	
13:10	<b>Lunch – Diamond Lower Ground Floor Lobby</b>		

	<b>Lecture Theatre 5</b>	<b>Lecture Theatre 6</b>	<b>Lecture Theatre 7</b>
<b>14:10</b>	<b>Session 3.3a</b> <b>Chair: K.Goh</b>	<b>Session 3.3b</b> <b>Chair: J.P.M. Hoefnagels</b>	<b>Session 3.3c</b> <b>Chair: I. Antoniadou</b>
<b>14:10</b>	<b>Experimental Biomechanics 2</b>	<b>Strain Measurement at the Microscale 3</b>	<b>Structural Health Monitoring and NDT</b>
<b>14:10</b>	18. 3D shape and full-field strain measurement in a coronary artery using 3D-DIC, P. Ferraiuoli <sup>1,2</sup> , J.W. Fenner <sup>1,2</sup> , A.J. Narracott <sup>1,2</sup> ; <sup>1</sup> Mathematical Modelling in Medicine Group, IICD Department, University of Sheffield, UK; <sup>2</sup> Insigneo Institute for in silico medicine, University of Sheffield, UK	7. Interface chemistry and strain rate effect on fracture in energetic material interfaces; C. Prakash <sup>1</sup> , I. E. Gunduz <sup>2</sup> , V. Tomar <sup>1</sup> ; <sup>1</sup> School of Aeronautics and Astronautics, Purdue University, USA; <sup>2</sup> School of Mechanical Engineering, Purdue University, USA	19. Damage detection in CFRP Composite Plate based on evolving Modal Parameters, D. M. Amafabia <sup>1</sup> , O. David-West <sup>1</sup> , D. Montalvão <sup>2</sup> , G. Haritos <sup>1</sup> ; <sup>1</sup> University of Hertfordshire, UK; <sup>2</sup> Bournemouth University, Dorset, UK.
<b>14:30</b>	88. Shore OO Hardness Measurement of Bovine Aorta and Mock Vessel Materials for Endovascular Device Design; C. Maclean <sup>1</sup> , R. Brodie <sup>2</sup> and D.H. Nash <sup>1</sup> , <sup>1</sup> University of Strathclyde, Glasgow, Scotland, UK; <sup>2</sup> Vascutek Ltd., Inchinnan, Scotland, UK	39. Simultaneous micropillar Compression and X-ray scattering or diffraction to investigate scale effects of strains in mineralised collagen fibres, A. Groetsch <sup>1</sup> , A. Gourrier <sup>2</sup> , J. Schwiedrzik <sup>3</sup> , M. Sztucki <sup>4</sup> , J. Shephard <sup>1</sup> , J. Michler <sup>3</sup> , P. K. Zysset <sup>5</sup> , U. Wolfram <sup>1</sup> , <sup>1</sup> Heriot-Watt University, Edinburgh, UK; <sup>2</sup> Université Grenoble Alpes, France; <sup>3</sup> EMPA, Switzerland; <sup>4</sup> European Synchrotron Radiation Facility (ESRF), France; <sup>5</sup> University of Bern, Switzerland;	36. Predicting Machining Centre Geometric Tolerance Thresholds with Support Vector Machines, T. Rooker <sup>1</sup> , N. Dervilis <sup>1</sup> J. Stammers <sup>2</sup> , K. Worden <sup>1</sup> , P. Hammond <sup>3</sup> , T. Brown <sup>3</sup> , G. Potts <sup>3</sup> ; <sup>1</sup> The University of Sheffield, U.K. <sup>2</sup> AMRC with Boeing, U.K. <sup>3</sup> Metrology Software Products Ltd., Alnwick, U.K.
<b>14:50</b>	94. Optical strain measurement techniques for soft cellular structures; H.L. Wyatt <sup>1</sup> , A. Clarke <sup>2</sup> , S.L. Evans <sup>2</sup> , and L.A. Mihai <sup>1</sup> , <sup>1</sup> School of Mathematics; <sup>2</sup> School of Engineering, Cardiff University, Wales, UK	68. Crystal plasticity parameter identification by Integrated DIC on microscopic topographies, J.P.M. Hoefnagels <sup>1</sup> , M. Bertin <sup>2</sup> , C. Du <sup>1</sup> , and F. Hild <sup>2</sup> , <sup>1</sup> Eindhoven University of Technology, The Netherlands, <sup>2</sup> LMT, ENS Cachan, CNRS, Université, Paris-Saclay, France	56. A wavelet transform approach for acoustic emission localisation and an examination of PZT sensor self-diagnostics I. Martinez, A. G. P. Reid, M. Marshall and I. Antoniadou; The University of Sheffield, UK
<b>15:15</b>	<b>Closing Plenary Session - Lecture Theatre 5</b>		
<b>15:30</b>	<b>Refreshments – Diamond Lower Ground Floor Lobby</b>		