



fatigue design2021

9th edition

of the International conference on fatigue design

PARTNER COUNTRY: GERMANY



17 & 18
November 2021
Senlis - France

fatiguedesign.org



The 9th Fatigue Design conference, to be held in 2021, aims to present the most innovative approaches and scientific progress in design methodologies, tools, and equipment's life extension, focusing on industrial applications.

For this edition, a special focus is made on the contribution of Big Data and Artificial Intelligence to the fatigue design world.

To facilitate exchanges among participants, in addition to the two days of lectures, there will be:

- a posters exhibition,
- a technological showcase by service providers and technology suppliers.

For the fourth time, the organizing committee has decided to dedicate the conference to the scientific community from a specific country. After USA in 2015, Italy in 2017, Japan in 2019 in respect to German advance research works in the area of fatigue and fracture mechanics in the last years, it has been decided to consider Germany as the "partner country" for this conference.

The organizing committee wants to keep the conviviality of a face-to-face conference which is the soul of the Fatigue Design conference since 2005. However in regarding the current health situation, the conference is also available in a digital version.



Organizing committee

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*SF2M Fatigue commission

From the partner country, Germany

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M. Brune (DVM)	P. Heuler (DVM)	C. Sonsino (LBF)
S. Chéreau (BMW)	M. Madia (BAM)	M. Vormwald (TU Darmstadt)
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8:30 - 9:00 **Opening statement**

Room 6

9:00 - 10:30 **Plenary session**

Room 6

50 - Experimental-numerical analysis microstructure-property linkages for additively manufactured materials

Alexander Raßloff¹, Paul Schulz², Robert Kühne³, André T. Zeuner³, Marreddy Ambati¹, Ilja Koch^{2,4}, Maik Guda², Martina Zimmermann³, Markus Kästner^{1,4,5} - ¹Chair of Computational and Experimental Solid Mechanics, Dresden, Germany. ²Institute of Lightweight Engineering and Polymer Technology, Dresden, Germany. ³Division Materials Characterisation and Testing, Fraunhofer IWS, Dresden, Germany. ⁴Dresden Center for Fatigue and Reliability, Dresden, Germany. ⁵Dresden Center for Computational Materials Science, Dresden, Germany

61 - Fatigue damage estimation in vehicle thermal subsystems from minimal instrumentation thanks to a mixed engineering / Data science approach

Tudor Miu¹, Marco Bonato², Frédéric Kihm³ - ¹Hottinger Bruel Kjaer, Rotherham, United Kingdom. ²Valeo, La Verriere, France. ³Hottinger Bruel Kjaer, Roissy en France, France

10:30 - 11:15 ☕ **Coffee - Exhibition - Poster Session**



11:15 - 12:45

Room 6

S01-1 Additive manufacturing

8 - Fatigue property-performance relationship of additively manufactured Ti-6Al-4V bracket for aero-engine application: An experimental study

Alok Gupta^{1,2}, Chris J. Bennett², Wei Sun² - ¹Rolls Royce plc, Derby, DE24 8BJ, United Kingdom. ²Gas Turbine and Transmissions Research Centre (G2TRC), Faculty of Engineering, University of Nottingham, University Park, Nottingham, NG7 2RD, United Kingdom

16 - Image-based and in-situ measurement techniques for the characterization of the damage behavior of additively manufactured lattice structures under fatigue loading

Wiebke Radlof, Manuela Sander - Institute of Structural Mechanics, Faculty of Mechanical Engineering and Marine Technology, University of Rostock, Rostock, Germany

27 - Comparison of different approaches to model fatigue for SLM specimens considering production-related characteristics

Michaela Zeißig¹, Frank Jablonski² - ¹University of Bremen, Bremen, Germany. ²University of Applied Sciences Bremen, Bremen, Germany

Room 7

S07-1 Experimental and numerical design and validation methods

6 - Structural integrity proof of automotive safety parts

Matteo Facchinetti - PSA Groupe, Voujeaucourt, France

30 - Identification method of vehicle loads using a multi body vehicle model, real sensors and an extended Kalman filter

Debarbouillé Alexandre^{1,2}, Dion Jean-Luc², Renaud Franck², Dimitrijevic Zoran¹, Chojnacki Denis¹ - ¹PSA Groupe, Vélizy, France. ²Supméca, Quartz Lab, Saint-Ouen, France

32 - Optimized vehicle durability testing by means of an intelligent test driver guidance system

Florian Grober¹, Andreas Janßen¹, Ferit Küçükay² - ¹Volkswagen AG, Wolfsburg, Germany. ²Institut für Fahrzeugtechnik, Braunschweig, Germany

Room 8

S04-1 Composites, elastomers and adhesive bonding

88 - Stress-related structural durability engineering of mounting parts subjected to inertia forces with multi-axial dynamic excitations

Sébastien Chéreau, Felix Bilger, Kurt Poetter - BMW AG, Munich, Germany

19 - Fatigue and damage assessment of CFRP material using digital image correlation

Sara Eliasson^{1,2,3}, Lars Berg^{1,2,3}, Per Wennhage^{1,2}, Zuheir Barsoum¹ - ¹KTH Royal Institute of Technology, Department of Engineering Mechanics, Stockholm, Sweden. ²Centre for ECO2 Vehicle Design, Stockholm, Sweden. ³Scania CV AB, Södertälje, Sweden

86 - Numerical calculation of homogenized effective material properties of the single ply for arbitrary fiber distributions

Sebastian Spanke, Jan Scholten, Henning Haensel, Jochen Höhbusch - AG BMFT, Ruhr-University Bochum, Bochum, Germany

Room 9

S03-1 Complex loading

47 - A systematic experimental study on the impact of multiaxiality and non-proportionality on fatigue life of cast steels at high temperature

Karl Michael Kraemer, Alexander Erbe, Fabian Conrad, Christian Kontermann, Matthias Oechsner - TU Darmstadt - MPA/IfW, Darmstadt, Germany

46 - Multiaxial variable amplitude loading for automotive parts fatigue life assessment: a loading classification-based approach proposal

Enora Bellec^{1,2}, Matteo Luca Facchinetti¹, Cédric Doudard², Sylvain Calloch², Sylvain Moyne² - ¹Groupe PSA, Voujeaucourt, France. ²ENSTA Bretagne, IRDL, Brest, France

120 - Methodology for evaluating the probability of failure of a mechanical component in multiaxial fatigue

Guillaume Causse¹, Thierry Yalamas² - ¹Phimeca, Chavanod, France. ²Phimeca, Paris, France

12:45 - 14:00  Lunch

14:00 - 16:00

Room 6

S02-1 Big data and artificial intelligence

95 - Smart testing : IoT applied to fatigue test monitoring

[Xavier Hermite](#), Fabien Lefebvre, Matthieu Cronnier - *Cetim, Senlis, France*

48 - A data-driven approach for approximating nonlinear dynamic systems using LSTM networks

[Leonhard Heindel](#)¹, Peter Hantschke^{1,2}, Markus Kästner^{1,2} - ¹*Technische Universität Dresden, Dresden, Germany.* ²*Dresden Center for Fatigue and Reliability (DCFR), Dresden, Germany*

7 - How fraud detection technologies can help to detect damages in aircraft structures

[Arnaud Cugniere](#), Olaf Tusch, Andreas Mösenbacher - *IABG mbH, Ottobrunn, Germany*

9 - Prediction of fatigue failure in small-scale butt-welded joints with explainable machine learning

[Moritz Braun](#), Leon Kellner, Sören Ehlers - *Hamburg University of Technology, Hamburg, Germany*

Room 7

S01-2 Additive manufacturing

28 - Estimating the fatigue thresholds of wrought and additively manufactured metallic materials with consideration of defects

[Daniele Rigon](#), Giovanni Meneghetti - *University of Padova, Department of Industrial Engineering, via Venezia 1 – 35131, Padova, Italy*

31 - Correlation between quasistatic and fatigue properties of additively manufactured AISi10Mg using laser powder bed fusion

[Andreas Kempf](#)^{1,2}, Julius Kruse³, Mauro Madia³, Kai Hilgenberg^{2,4} - ¹*Volkswagen AG, Werkstofftechnik, Wolfsburg, Germany.* ²*Technische Universität Berlin, Institut für Werkzeugmaschinen und Fabrikbetrieb, Berlin, Germany.* ³*Bundesanstalt für Materialforschung und -prüfung (BAM), Division 9.4 – Weld Mechanics, Berlin, Germany.* ⁴*Bundesanstalt für Materialforschung und -prüfung (BAM), Division 9.3 – Welding Technology, Berlin, Germany*

40 - Effects of the modification of standard powder particle size on fatigue performance of laser powder-bed fused Ti-6Al-4V

Arash Soltani-Tehrani¹, Mohammad Salman Yasin¹, Shuai Shao¹, [Meysam Haghshenas](#)², Nima Shamsaei² - ¹*Auburn University, Auburn, USA.* ²*University of Toledo, Toledo, USA*

66 - Fatigue behaviour assessment of an industrial component produced by additive manufacturing processes: the hydraulic block

[Christophe Grosjean](#)¹, Philippe Amuzuga², Michel Marzin², Etienne Camus², Fabien Lefebvre², Thomas Munch³ - ¹*Cetim, St Etienne, France.* ²*Cetim, Senlis, France.* ³*Liebherr, Colmar, France*

Room 8

S08-1 Fatigue of assemblies

3 - Fatigue and ultimate strength assessment of post weld treated strenx 1100 plus butt welds

Tobias Jonsson¹, Torbjörn Narström², [Zuheir Barsoum](#)¹ - ¹*KTH Royal Institute of Technology, Stockholm, Sweden.* ²*SSAB AB, Oxelösund, Sweden*

14 - The peak stress method applied to fatigue lifetime estimation of welded steel joints under variable amplitude multiaxial local stresses

Luca Vecchiato, Alberto Campagnolo, Beatrice Besa, [Giovanni Meneghetti](#) - *Department of Industrial Engineering, University of Padova, Padova, Italy*

17 - Fatigue assessment of welded joints including the effect of residual stresses

[Andrea Chiocca](#), Francesco Frenzo, Leonardo Bertini - *Department of Civil and Industrial Engineering, University of Pisa, Pisa, Italy*

64 - Fatigue evaluation of beam cope holes in the web coinciding with thickness transition in the flange (study commissioned by ASF-Vinci and french road directorate)

[Jacques Berthelémy](#) - *Cerema, Marne la Vallée, France*

Room 9

S06-1 Damage tolerance and fatigue life

53 - Assessment of fatigue crack growth based on 3D finite element modeling approach

Paul Ilie¹, [Ayhan Ince](#)¹, Adrian Loghin² - ¹*Concordia University, Montreal, QC, Canada.* ²*Simmetrix Inc., Clifton Park, NY, USA*

65 - Crack propagation analysis using XFEM and following evaluation of deck repair projects at rib-to-deck welding for steel orthotropic bridge decks

[Jacques Berthelémy](#)¹, Morteza AhmadiVala² - ¹*Cerema, Marne la Vallée, France.* ²*Université Clermont Auvergne, Clermont-Ferrand, France*

20 - Experimental study of a CoCrMo alloy treated by SMAT under rotating bending fatigue

[Lucas Brasileiro](#)¹, Zhidan Sun¹, Catherine Mabru², Rémy Chieragatti², Gwénaëlle Proust³, Delphine Reira¹ - ¹*ICD, P2MN, Lasnis, Université de Technologie de Troyes (UTT), Troyes, France.* ²*ICA, Université de Toulouse, ISAE-Supaero, Mines Albi, UPS, INSA, CNRS, Toulouse, France.* ³*School of Civil Engineering, The University of Sydney, NSW 2006, Sydney, Australia*

21 - The effect of the environmental conditions on the threshold against fatigue crack propagation

[Larissa Duarte](#), Mauro Madia, Uwe Zerbst - *Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany*

16:00 - 17:15  Coffee - Exhibition - Poster Session

17:15 - 18:45

Room 6

S08-2 Fatigue of assemblies

67 - Overview on the fatigue strength of single-sided transverse and longitudinal fillet weld joints

Antti Ahola¹, Tuomas Skriko², Timo Björk¹ - ¹Laboratory of Steel Structures, LUT University, Lappeenranta, Finland. ²Laboratory of Welding Technology, LUT University, Lappeenranta, Finland

69 - Influence of overload on fatigue behaviour of longitudinal non-load-carrying welded joints

Isabel Huther¹, Fabien Lefebvre¹, Benaouda Abdellaoui¹, Vincent Leray² - ¹Cetim, Senlis, France. ²Nov BLM, Nantes, France

111 - A stochastic modeling of fatigue behavior on welding joints in automotive structures

H. Guo^{1,3}, P. Feissel¹, F. Druesne¹, N. Limnios², S. Bouzebda², A. Patigniez³, S. Bouyau³ - ¹Sorbonne Universités, Université de Technologie de Compiègne, Laboratoire Roberval FRE UTC-CNRS 2012. ²Sorbonne Universités, Université de Technologie de Compiègne, Laboratoire LMAC EA2222. ³Renault, Le Mans, France

Room 7

S07-2 Experimental and numerical design and validation methods

36 - Towards a better understanding of mechanical stress applied by passenger vehicle customers with optimized instrumentation and relevant data post-processing methodologies

Denis Chojnacki - PSA Groupe, Sochaux, France

49 - Phase-field modelling of fatigue failure in ductile materials

Martha Seiler¹, Marreddy Ambati¹, Markus Kästner^{1,2,3} - ¹Chair of Computational and Experimental Solid Mechanics, Dresden, Germany. ²Dresden Center for Computational Materials Science, Dresden, Germany. ³Dresden Center for Fatigue and Reliability, Dresden, Germany

59 - Advanced fatigue assessment - The future of wind turbine towers

Hendrik Bissing¹, Marion Rauch², Markus Knobloch¹ - ¹Ruhr-Universität Bochum, Bochum, Germany. ²Hochschule Kaiserslautern, Kaiserslautern, Germany

Room 8

S04-2 Composites, elastomers and adhesive bonding

18 - An investigation of the residual stiffness and strength of a glass fibre reinforced composite in high cycle fatigue experiments

Stephan Häusler, Richard Fink, Christopher Benz, Manuela Sander - Institute of Structural Mechanics, University of Rostock, Rostock, Germany

80 - Towards a methodology to estimate the experimental fatigue limit for thermoplastic elastomer materials: A mechanical behaviour modelling with hysteresis loops

Laurent Gornet¹, Pierre Robard¹, Patrick Rozycki¹, Gilles Marckmann¹, Jean Charles Guldner², Frédéric Maitay² - ¹GeM - Institut de Recherche en Génie Civil et Mécanique, UMR 6183, CNRS, Ecole Centrale de Nantes, Nantes, France. ²Trelleborg Boots, Carquefou, France

90 - Ply scale modelling of the fatigue behaviour of a glass fibre / acrylic matrix composite material covering the service temperature range of wind turbine blades

Eileen Boissin¹, Christophe Bois¹, Jean-Christophe Wahl¹, Thierry Palin-Luc², Damien Caous³ - ¹I2M, Université de Bordeaux, Bordeaux, France. ²I2M, Arts et Métiers, Bordeaux, France. ³Tensyl, Perigny, France

Room 9

S03-2 Complex loading

10 - Local prestressing of cold forging tools by reinforcements with adapted interference

Martin Killmann, Marion Merklein - Institute of Manufacturing Technology, Friedrich-Alexander University Erlangen-Nuremberg, Erlangen, Germany

58 - Fracture fatigue life calculations with the local strain approach

Melanie Fiedler¹, Michael Vormwald² - ¹Structural Durability Group, Institute for solid mechanics, TU Dresden, Dresden, Germany. ²Material Mechanics Group, TU Darmstadt, Darmstadt, Germany

91 - Nonlinear modal time history analysis : allowing for quick stress determination taking nonlinear phenomena into account

Romain Duval - Cetim, Senlis, France

19:15 - 23:00  Social event - Gala evening at Cetim



8:30 - 10:00

Room 6

S08-3 Fatigue of assemblies

78 - Influence of out-of-plane deformation on fatigue strength of web gusset welded joints

Yuki Takahashi¹, Masahiro Sakano¹, Taiga Teranishi¹, Yoshihiko Takada² - ¹Kansai University, Osaka, Japan. ²Hanshin Expressway Management and Applied System Engineering, Osaka, Japan

89 - Fatigue design of mild and high-strength steel cruciform joints in as-welded and HFMI-treated condition by nominal and effective notch stress approach

Peter Brunnhofer, Christian Buzzi, Tobias Pertoll, Martin Rieger, Martin Leitner - Graz University of Technology, Institute of Structural Durability and Railway Technology, Graz, Austria

101 - Fatigue testing and analysis of aluminum welds in highway bridge decks

Mahmoud Trimech¹, Charles-Darwin Annan¹, Scott Walbridge²
¹Université Laval, Québec, Canada. ²University of Waterloo, Waterloo, Canada

Room 7

S07-3 Experimental and numerical design and validation methods

62 - Digital twin for fatigue analysis

Amaury Chabod - HBK, Roissy-en-France, France

75 - Fatigue strength of laser-dressed non-load-carrying fillet weld joints made of ultra-high-strength steel

Tuomas Skriko, Antti Ahola, Ilkka Poutiainen, Timo Björk - Lappeenranta-Lahti University of Technology LUT, Lappeenranta, Finland

93 - On the evaluation of overload effects on the fatigue performance of engineering materials

Kimiya Hemmes¹, Franz Ellmer², Majid Farajian³, Michael Luke¹
¹Fraunhofer Institute of Mechanics of Materials IWM, Freiburg, Germany. ²SWM Struktur- und Werkstoffmechanikforschung, Dresden, Germany. ³GSI Gesellschaft für Schweißtechnik International, Duisburg, Germany

Room 8

S04-3 Composites, elastomers and adhesive bonding

5 - Joint strengths and fatigue properties of Al/steel dissimilar adhesive joints

Yoshihiko Uematsu - Gifu University, Gifu, Japan

79 - Fatigue of adhesive bonding: world first fatigue s-n curve for fpso application

Firas Sayedi¹, Luc Mouton² - ¹Cold Pad, Paris, France. ²Bureau Veritas, Nantes, France

104 - Fatigue strength of adhesively bonded tube-tube specimens under multiaxial loading with constant and variable amplitudes

Matthias Hecht¹, Jörg Baumgartner^{1,2} - ¹Technical University of Darmstadt, Darmstadt, Germany. ²Fraunhofer LBF, Darmstadt, Germany

Room 9

S10-1 Taking into account manufacturing process in fatigue analysis

24 - Design of microstructural gradient for fatigue properties of pearlitic steels

Lais Avila de Oliveira Silva¹, Christophe Mesplont², Jérémie Bouquere¹, Jean-Bernard Vogt¹ - ¹Univ. Lille, CNRS, INRAE, Centrale Lille, UMR 8207 - UMET - Unité Matériaux Et Transformations, Lille, France. ²Bekaert, Zvevegem, Belgium

41 - A comparative study on fatigue performance of various additive manufactured titanium alloys

Mohammad Salman Yasin¹, Arash Arash Soltani-Tehrani¹, Shuai Shao¹, Meysam Haghshenas², Nima Shamsaei¹ - ¹Auburn University, Auburn, USA. ²University of Toledo, Toledo, USA

35 - Estimation of fatigue life for clinched joints with the local strain approach

Boris Spak¹, Markus Kästner², Melanie Fiedler¹ - ¹Structural Durability Group, TU Dresden, Dresden, Germany. ²Chair of Computational and Experimental Solid Mechanics, TU Dresden, Dresden, Germany

10:00 - 10:45  Coffee - Exhibition - Poster Session

10:45 - 12:15

Room 6

S01-3 Additive manufacturing

105 - The effect of surface state on the crack initiation mechanisms of additively manufactured titanium components for aeronautical applications

David Mellé^{1,2}, Etienne Pessard², René Billardon³, Franck Morel², Daniel Bellett², Martine Monin¹, Sandy Blanc⁴ - ¹Safran Tech, Materials and Processes department, Magny les hameaux, France. ²Arts et Métiers Institute of Technology, LAMPA, HESAM Université, Angers, France. ³Safran Landing Systems, Vélizy-Villacoublay, France. ⁴Safran Additive Manufacturing, a technology platform of Safran Tech, Magny les hameaux, France

45 - Influence of post-processing treatments on the fatigue behavior of notched additive manufactured TA6V: Rapid fatigue characterization using staircase procedure and infrared techniques

Théo Dusautoir¹, Bruno Berthel¹, Siegfried Fouvry¹, Paul Matzen², Klaus-Dieter Meck² - ¹LTDS UMR 551 Ecole Centrale de Lyon, 36 Avenue Guy de Collongue, 69134 Ecully Cedex, France. ²John Crane, 31 Nash Road, Trafford Park, Manchester M17 1SS, United Kingdom

73 - State of the art of fatigue strength of materials & structures from additive manufacturing - The pivot, A Cetim

Room 7

S08-4 Fatigue of assemblies

83 - Parametric calculations of service fatigue life of welded t-joints

Miloslav Kepka, Miloslav Kepka Jr. - University of West Bohemia, Pilsen, Czech Republic

2 - Life-cycle energy analysis of a high strength steel heavy vehicle component subjected to fatigue loading

Nitish Shetye, Mathilda Hagnell Karlsson, Per Wennhage, Zuheir Barsoun - KTH Royal Institute of Technology, Stockholm, Sweden

81 - Investigation of fatigue performance for structural steels and their weldments in vhc domain

Yevgen Gorash¹, Tugrul Comlekci¹, Gary Styger² - ¹University of Strathclyde, Glasgow, United Kingdom. ²Weir Minerals, Johannesburg, South Africa

Room 8

S06-2 Damage tolerance and fatigue life

22 - Determination of fatigue crack propagation thresholds using small-scale specimens

Tiago Werner¹, Sergio Blasón¹, Mauro Madia¹, Julius Kruse¹, Matteo Benedetti² - ¹Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany. ²University of Trento, Trento, Italy

25 - Estimation of the Kitagawa-Takahashi diagram by cyclic R-curve analysis

Mauro Madia, Uwe Zerbst, Tiago Werner - Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany

34 - Fatigue strength of autofrettaged component-like specimens made of ultra high strength steel

Carl Fällgren, Heinz Thomas Beier, Michael Vormwald - Materials Mechanics Group, Department of Civil and Environmental Engineering, Technical University of Darmstadt, Darmstadt, Germany

Room 9

S10-2 Taking into account manufacturing process in fatigue analysis

82 - Effect of machining, heat and surface treatment process on gear fatigue performance (bending and pitting)

Victorien Gautheron¹, Simon Jolivet¹, Hind Orkhis², Marion Risbet³, Julie Marteau³, Fabien Lefebvre¹, Hervé Rognon¹ - ¹Cetim, Senlis, France. ²GIMA, Beauvais, France. ³UTC, Compiègne, France

103 - High cycle fatigue behaviour of high-pressure die-cast aluminium alloy AlSi₉Cu₃: Role of defects and loading conditions

Thomas Landron^{1,2,3}, Franck Morel¹, Nicolas Saintier², Viet Duc Le¹, Daniel Bellett¹, Pierre Osmond³ - ¹Arts et Métiers Institute of Technology, LAMPA, HESAM Université, Angers, France. ²Arts et Métiers Institute of Technology, I2M, HESAM Université, Bordeaux, France. ³Stellantis, Carrières sous Poissy, France

56 - Fatigue software smart use to calculate by FEA a complete map of the damage due to a duty cycle, regarding thermo-mechanical fatigue failure mode Application to a truck cylinder head lifetime assessment

Barthoux Kamilia¹, Blondet Hubert² - ¹Volvo GTT, Saint-Priest, France. ²Arobas Technologies, Ecully, France

12:15 - 13:30 | Lunch

13:30 - 15:30

Room 6

S01-4 Additive manufacturing

94 - Experimental and numerical study of fatigue behavior of Ti6Al-4V architected materials obtained by additive manufacturing

Marie Pirotais, Nicolas Saintier, Charles Brugger - *I2M, Talence, France*

98 - Contribution of the introduction of artificial defects by additive manufacturing to the determination of the Kitagawa diagram of Al-Si alloys

Matthieu Bonneric¹, Charles Brugger¹, Nicolas Saintier¹, Antonio Castro-Moreno², Benoît Tranchand² - ¹Arts et Métiers Institute of Technology, Bordeaux - Talence, France. ²IRT Saint-Exupéry, Toulouse, France

102 - Influence of microstructure on fatigue behaviour of 316L stainless steel manufactured by laser powder bed fusion (LPBF)

Hugo Roirand^{1,2,3}, Benoit Malard³, Anis Hor³, Nicolas Saintier¹ - ¹I2M, Bordeaux, France. ²ICA, Toulouse, France. ³CIRIMAT, Toulouse, France

52 - Room temperature mechanical properties of additively manufactured ni-base superalloys: A comparative study

Seyed Ghiaasiaan^{1,2}, Muztahid Muhammad^{1,2}, Arash Tehrani^{1,2}, Shuai Shao^{1,2}, Nima Shamsaei^{1,2} - ¹National Center for Additive Manufacturing Excellence (NCAME), Auburn University, Auburn, AL, USA. ²Department of Mechanical Engineering, Auburn University, Auburn, AL, USA



Room 7

S09-1 Reliability-based approaches and probabilistic methods

33 - Analysis of real-life multi-input loading histories for the reliable design of vehicle chassis

Emilien Baroux^{1,2,3}, Benoit Delattre¹, Ida Raoult¹, Patrick Pamphile³, Andrei Constantinescu² - ¹Groupe PSA, Vélizy, France. ²Laboratoire de Mécanique des Solides, Palaiseau, France. ³Laboratoire de Mathématiques d'Orsay, Orsay, France

55 - A methodology for the probabilistic analysis of fatigue cumulative damage cases

Enrique Castillo¹, Sergio Blasón², Miguel Muniz-Calvente³, Alfonso Fernández-Canteli⁴ - ¹Spanish Royal Academy of Engineering, Madrid, Spain. ²Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany. ³University of Oviedo, Gijón, Spain. ⁴University of Oviedo, Gijón, Spain

70 - A new generic method to analyze fatigue results

Robin Hauteville, Xavier Hermite - *Cetim, Senlis, France*

97 - Scatter and size effect in high cycle fatigue strength due to the effects of porosity in cast aluminum-silicon alloys: Probabilistic modelling

Driss El Khoukhi^{1,2}, Franck Morel¹, Nicolas Saintier³, Daniel Bellett¹, Pierre Osmond², Viet-Duc Le¹ - ¹Arts et Métiers Institute of Technology, Angers, France. ²PSA group, Carrières-sous-Poissy, France. ³Arts et Métiers Institute of Technology, Bordeaux, France



Room 8

S06-3 Damage tolerance and fatigue life

87 - Residual Life Assessment (RLA) of structures and equipment

Bruno Depale, Mohamed Bennebach - *Cetim, Senlis, France*

100 - Instrumented fatigue tests on 316L and TA6V samples produced by wire arc additive manufacturing

Hacquard Christophe, Deschaux-Beaume Frédéric, Wattrisse Bertrand, Muracciole Jean-Michel, Soulié Fabien - *LMGC, Montpellier, France*

13 - 3D FEA based surrogate modeling in fatigue crack growth life assessment

Adrian Loghin¹, Shakhrukh Ismonov² - ¹Simmetrix Inc, Clifton Park, USA. ²Jacobs Technologies Inc., Houston, USA

Room 9

S05-1 Contact fatigue, fretting and vibration

68 - Fretting cracking behaviour of an Al/SiC composite: influence of the anisotropy of the reinforcing particles orientation

Jean Balmon¹, Julien Said¹, Siegfried Fouvry¹, Patrick Villechaise², Jean-Yves Buffière³, Josselin Paturaud⁴, Julien Feraille⁵, Nicolas Guillemot⁵ - ¹Laboratory of Tribology and Systems Dynamics, Ecole Centrale de Lyon, Ecully, France. ²PPRIME Institute, ISAE-ENSMA, Chasseneuil-du-Poitou, France. ³MATEIS laboratory, INSA Lyon, Villeurbanne, France. ⁴LISI Aerospace, Saint-Ouen-l'Aumône, France. ⁵AIRBUS, Marignane, France

112 - Wear resistance under fretting conditions, an alternative to hard chrome plating by using thermal spraying

C.Trevisiol¹, D. Dublanche², S. Beauvais³, E. Aubignat³, P. Spiller⁴, Y.M. Chen¹, C. Luh-Minh¹, A. Govaere¹, R. Jacques¹, K. Leclerc¹, D. Cazé¹ - ¹Cetim, Tribology laboratory, Metallic Materials and Surfaces, Senlis, France. ²Bodycote, Aerospace & Defense & Energy, Ambazac, France. ³Ouest Coating, Quality/R&D service, Saint Nazaire, France. ⁴APS Coating solutions, Marne-la-Vallée, France.

72 - Multi-scale modelling and testing of overhead conductors under vibrating loadings

Julien Said¹, Siegfried Fouvry¹, Marc Coulangeon², Jerome Brocard³, Georges Cailletaud³, Christine Yang⁴, Fikri Hafid⁴ - ¹LTDS, Ecole Centrale de Lyon, Lyon, France. ²Dervaux S.A., Le Chambon-Feugerolles, France. ³Centre des Matériaux, Mines PARISTECH, Evry, France. ⁴Rte, Paris La Défense, France

37 - Effects of inappropriate sampling on counting algorithms in vibration fatigue

Arvid Trapp, Quirin Hösch, Peter Wolfsteiner - *Munich University of Applied Sciences, Munich, Germany*

15:30 - 16:00 ☕ Coffee - Exhibition - Poster Session

16:00 - 17:30 Plenary session

Room 6

11 - Artificial neural network approach integrated with finite element analysis for residual stress simulation of direct metal deposition process

Farshid Hajjalizadeh, Ayhan Ince - *Concordia University, Montreal, Canada*

99 - Definition of simplified fatigue tests using numerical fatigue simulation methods

Ronald Schrank - *IAMT Engineering GmbH & Co. KG, Ludwigsfelde, Germany*

17:45 End of the conference

Poster Session

2- Life-cycle energy analysis of a high strength steel heavy vehicle component subjected to fatigue loading

Nitish Shetye, Mathilda Hagnell Karlsson, Per Wennhage, Zuheir Barsoum - *KTH Royal Institute of Technology, Stockholm, Sweden*

12- The cyclic strain evolution and the fatigue prediction in non-proportional multiaxial loadings of NiTi SMAs

Di Song^{1,2,3}, Chao Yu⁴ - ¹School of Mechanical and Electrical Engineering, University of Electronic Science and Technology of China, Chengdu, China. ²Materials Mechanics Group, Department of Civil and Environmental Sciences, Technical University of Darmstadt, Darmstadt, Germany. ³Institute of Electronic and Information Engineering of UESTC in Guangdong, Dongguan, China. ⁴School of Mechanics and Engineering, Southwest Jiaotong University, Chengdu, China

23- Comparison of the fatigue behavior of wrought and additively manufactured AISI 316L

Tiago Werner, Mauro Madia, Uwe Zerbst - *Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany*

24- Design of microstructural gradient for fatigue properties of pearlitic steels

Lais Avila de Oliveira Silva, Christophe Mesplont, Jérémie Bouquere, Jean-Bernard Vogt - *Univ. Lille, CNRS, INRAE, Centrale Lille, UMR 8207 – UMET – Unité Matériaux Et Transformations, Lille, France. 2Bekaert, Zvevegem, Belgium*

26- Investigation of residual stresses and microstructure effects on the fatigue behavior of a L-PBF AISi10Mg alloy

Ilaria Roveda, Itziar Serrano-Munoz, Mauro Madia - *Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany*

35- Estimation of fatigue life for clinched joints with the local strain approach

Boris Spak¹, Markus Kästner², Melanie Fiedler¹ - ¹Structural Durability Group, TU Dresden, Dresden, Germany. ²Chair of Computational and Experimental Solid Mechanics, TU Dresden, Dresden, Germany

51- High temperature tensile and fatigue behaviors of additively manufactured IN625 and IN718

Sugrib Shaha^{1,2}, Seyed Ghiaasiaan^{1,2}, Arun Poudel^{1,2}, Nabeel Ahmed^{1,2}, Shuai Shao^{1,2}, Nima Shamsaei^{1,2} - ¹Department of Mechanical Engineering, Auburn University, Auburn, AL, USA. ²National Center for Additive Manufacturing Excellence (NCAME), Auburn University, Auburn, AL, USA

60- Fatigue assessment of the wind induced vibrations of a cable-stayed bridge

Jacques Berthelémy¹, Dominique Siegert², Edouard Berton³, Pierre Quentin⁴ - ¹Cerema, Marne la Vallée, France. ²UGE, Marne la Vallée, France. ³Cerema, Sourdun, France. ⁴Loire Atlantique (CD), Nantes, France

71- Fretting fatigue of shrink fitted assembly under rotating bending loading: a numerical and experimental study to compare Crossland fatigue stress analysis and Ruiz contact stress approach.

Benjamin Dieu^{1,2}, Siegfried Fouvry¹, Florent Bridier³, Christian Ménard³ - ¹Laboratory of Tribology and Systems Dynamics, LTDS, Lyon, France. ²Laboratory of Solid Mechanics, Palaiseau, France. ³Naval Group, Nantes, France

76- Fretting fatigue of lug-bush connection members with interference fit: comparison between a multiaxial fatigue stress analysis and “tribological” Ruiz surface stress approach.

Mélody Le Falher^{1,2}, Siegfried Fouvry¹, Clément Defaisse², Nicolas Hervé² - ¹LTDS, Ecole Centrale de Lyon, Lyon, France. ²Safran Transmission Systems, Colombes, France

77- Proposal and verification of countermeasure against fatigue cracking from welded joints between trough ribs and cross ribs in orthotropic steel decks

Yuichi Shirai¹, Masahiro Sakano¹, Chihiro Sakamoto², Hideyuki Konishi³, Koichi Omori⁴ - ¹Kansai University, Suita, Japan. ²The Japan Civil Engineering Consultants Association, Osaka, Japan. ³Japan Bridge Association, Osaka, Japan. ⁴Ministry of Land, Infrastructure, Transport and Tourism Kinki Regional Development Bureau, Osaka, Japan

82- Effect of machining, heat and surface treatment process on gear fatigue performance (bending and pitting)

Victorien Gautheron¹, Simon Jolivet¹, Hind Orkhis², Marion Risbet³, Julie Marteau³, Fabien Lefebvre¹, Hervé Rognon¹ - ¹Cetim, Senlis, France. ²GIMA, Beauvais, France. ³UTC, Compiègne, France

84- Fatigue life of welded junction by electron beam in Ti-6Al-4V

Natan Bodlet¹, Yves Nadot², Rémi Amargier³ - ¹PhD student, Poitiers, France. ²Professor, Poitiers, France. ³Airbus engineering, Toulouse, France

85- Interaction hydrogen/microstructure of a nickel base superalloy: Impact on low-cycle fatigue behavior and fatigue crack initiation

Achraf Radi¹, Marion Risbet¹, Jérôme Favergeon¹, Gilbert Hénaff², Abdelali Oudriss³, Xavier Feaugas³ - ¹Université de Technologie de Compiègne, Compiègne, France. ²ISAE-ENSMA, Poitiers, France. ³Université de la Rochelle, La Rochelle, France

92- Designing very high-cycle fatigue specimens of additively manufactured Ti-6Al-4V with different porosities and microstructures

Grégoire Brot^{1,2}, Véronique Favier¹, Imade Koutiri¹, Vincent Bonnard², Corinne Dupuy¹, Nicolas Ranc¹, Fabien Lefebvre³ - ¹Laboratoire PIMM, UMR 8006 Arts et Métiers-CNRS-CNAM, Paris, France. ²ONERA, The French Aerospace Lab, Châtillon, France. ³Cetim, Senlis, France

96- Scatter and size effect in high cycle fatigue of cast aluminum-silicon alloys: A comprehensive experimental investigation

Driss El Khoukhi^{1,2}, Franck Morel¹, Nicolas Saintier³, Daniel Bellet⁴, Pierre Osmond², Viet-Duc Le¹ - ¹Arts et Métiers Institute of technology, Angers, France. ²PSA Group, Carrières-sous-Poissy, France. ³Arts et Métiers institute of technology, Bordeaux, France. ⁴Arts et Métiers institute of technology, Angers, France

107- Numerical study of the influence of weld geometry variations on fatigue life using the notch stress analysis

Jinchao Zhu¹, Zuheir Barsoum¹, Rami Mansour² - ¹Lightweight Structures, Department of Engineering Mechanics, KTH Royal Institute of Technology, Teknikringen 8, 100 44 Stockholm, Sweden. ²Solid Mechanics, Department of Engineering Mechanics, KTH Royal Institute of Technology, Teknikringen 8, 100 44 Stockholm, Sweden



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November 17th at 13.45
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Schedules - Shuttles

Wednesday, November 17th

23.00 Shuttle from Gala evening ► to hotel's Senlis,
hotel's Saint- Witz

Thursday, November 18th

7.25 Shuttle from Novotel Saint-Witz
7.30 Golden Tulip Saint-Witz
7.40 Campanile Saint-Witz
7.55 Escapade Best Western Senlis
8.05 Campanile & Ibis Senlis
8.15 Final stop to Cetim

18.00 Shuttle from Cetim to Roissy Charles de Gaulle

Please present you 5 minutes before the announced time.
The bus may be a few minutes late depending on the traffic.



Gala evening at Senlis November 17th

19.15 - 23.00 Social Event
Gala evening at Cetim
23.00 Departure
to the hotels



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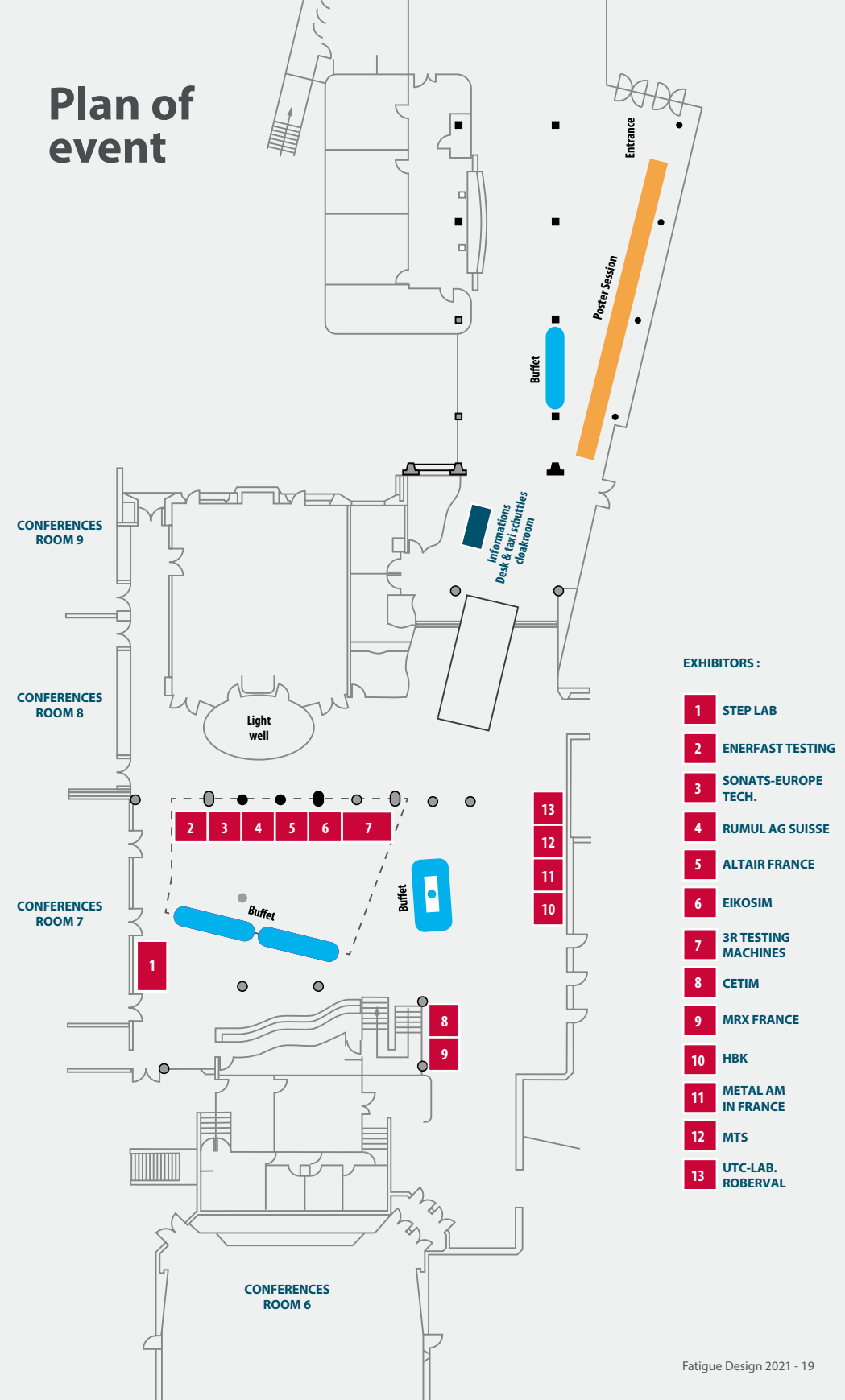


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- 4 RUMUL AG SUISSE
- 5 ALTAIR FRANCE
- 6 EIKOSIM
- 7 3R TESTING MACHINES
- 8 CETIM
- 9 MRX FRANCE
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- 11 METAL AM IN FRANCE
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