10th

fatigue design

International Conference

29 & 30 November 2023 • **France**

PROGRAM

Partners: Nordic Countries

fatiguedesign.org

#FatigueDesign

CETIM

AFM

SF2M Société Française de Métallurgie et de Matériaux

utc Université de Technologie Compiègne

ELSEVIER Publisher of the Fatigue Design 2023 proceedings

DVM

IFMS

Région Hauts-de-France

fatigue design

About

The 10th Fatigue Design conference held in 2023 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, the focus will be on Fatigue Life Extension and Residual Life Assessment.

Fatigue Design became the reference conference to address the concerns of industrials on fatigue design of structures and components. It is also considered as the trade crossroads between industry and academia: in 2021, 80 oral presentations were performed with 50% by industry.

Organizing Committee

F. Lefebvre *(CETIM/SF2M)*, **S. Courtin** *(EDF R&D/SF2M)*, **F. Morel** *(Arts et Métiers/SF2M)*, **S. Duarte** *(CETIM)*, **A. Rousseau** *(CETIM)*, **A. Preux** *(CETIM)*.

International Scientific Committee

M. Afzali	*France*	**A. Esderts**	*Germany*	**J. Lu**	*Hong-Kong*	**M.P. Repetto**	*Italy*
H. Ahmad	*UK*	**M.L. Facchinetti***	*France*	**M. Lukic**	*France*	**F. Rezaï-Aria***	*France*
H. Akebono	*Japan*	**M. Farajian**	*Germany*	**M. Madia**	*Germany*	**M. Risbet**	*France*
J.A. Araújo	*Brazil*	**A. Fatemi**	*USA*	**H. Maitournam**	*France*	**N. Saintier***	*France*
S. Asada	*Japan*	**S. Fouvry**	*France*	**L. Marcin***	*France*	**N. Shamsaei**	*USA*
M. Bacher-Höchst	*Germany*	**E. Ghafoori**	*Germany*	**D. McDowell**	*USA*	**C. Sonsino**	*Germany*
J. Baumgartner	*Germany*	**G. Glinka**	*Canada*	**G. Menghetti**	*Italy*	**P. Souquet**	*France*
M. Bennebach	*France*	**L. Gornet**	*France*	**A. Mösenbacher**	*Germany*	**A. Spagnoli**	*Italy*
A. Bernasconi	*Italy*	**N. Gubeljak**	*Slovenia*	**Y. Murakami**	*Japan*	**A. Sugeta**	*Japan*
M. Browne	*UK*	**M. Haghshenas**	*USA*	**Y. Nadot***	*France*	**F. Szmytka***	*France*
M. Brune	*Germany*	**G. Henaff**	*France*	**M. Nakane**	*Japan*	**M. Takanashi**	*Japan*
J.-Y. Buffière	*France*	**I. Huther**	*France*	**M. Nguyen***	*France*	**G. Thoquenne**	*France*
S. Calloch	*France*	**F. Iacoviello**	*Italy*	**A. Nussbaumer**	*Switzerland*	**Y. Uematsu**	*Japan*
A. Carpinteri	*Italy*	**A. Ince**	*Canada*	**T. Ogawa**	*Japan*	**S. Vantadori**	*Italy*
S. Chéreau	*Germany*	**M. Kinefuchi**	*Japan*	**H. Oguma**	*Japan*	**J.B. Vogt**	*France*
L. Coelho	*Portugal*	**B. Klimkeit**	*Germany*	**Y. Omoto**	*Japan*	**M. Vormwald**	*Germany*
P. Daguier*	*France*	**J. Komotori**	*Japan*	**D. Osage**	*USA*	**S. Walbridge**	*Canada*
M. Decker	*Germany*	**D. Kujawski**	*USA*	**P. Osmond**	*France*	**B. Weber***	*France*
P. Dong	*USA*	**F. Laurin**	*France*	**T. Palin-Luc***	*France*	**S. Werdin**	*Germany*
L. Dunai	*Hungary*	**Y.L. Lee**	*USA*	**A. Philippot**	*France*		
M. Endo	*Japan*	**F. Lefebvre** (Chairman)	*France*	**M. Quaresimin**	*Italy*		
C. Engler-Pinto	*USA*	**H.P. Lieurade***	*France*	**L. Rémy***	*France*		

**SF2M Fatigue commission*

Nordic Countries Scientific Committee

N. Asnafi	*Sweden*	**P.O. Danielsson**	*Sweden*	**D. Kallehave**	*Denmark*	**G. Marquis**	*Finland*
Z. Barsoum	*Sweden*	**D. Eichler**	*Denmark*	**T. Lassen**	*Norway*	**B.H. Skallerud**	*Norway*
F. Berto	*Norway*	**P.N. Haagensen**	*Norway*	**I. Lotsberg**	*Norway*	**H.C. Yildirim**	*Denmark*
T. Bjørk	*Finland*	**A.M. Horn**	*Norway*	**K.A. Macdonald**	*Norway*	**N. Zangenberg**	*Denmark*

Sponsors

Themes

The selected topics concern the various aspects of fatigue design:

– additive manufacturing,
– big data and artificial intelligence,
– complex loading,
– composites, elastomers and adhesive bonding,
– contact fatigue and fatigue in transmission system,
– experimental and numerical design and validation methods,
– fatigue and manufacturing process (effect of microstructure, welding, residual stresses,…),
– fatigue of assemblies (mechanical, welded, adhesive-bonding, multimaterials,…),
– fatigue under severe environmental conditions (hydrogen, corrosion, low temperature,…),
– non-linear behavior and cumulative damage,
– reliability–based approaches and probabilistic methods,
– vibration fatigue.

Wednesday, November 29th

8.30 am - 9.00 am **Opening Statement**

9.00 am - 9.45 am **Plenary Session**

75 - **Possibilities with High Frequency Mechanical Impact (HFMI) Treatment in Fatigue Life Extension of Welded Structures**

Zuheir Barsoum[1], Yuki Banno[1,2], Martin Edgren[1,3], Torbjörn Narström[1,4] - [1]*KTH Royal Institute of Technology, Stockholm, Sweden.* [2]*Gifu University, Gifu, Japan.* [3]*Dekra Industries, Stockholm, Sweden.* [4]*SSAB, Oxelösund, Sweden*

9.45 am - 10.30 am **Plenary Session**

6 - **Application of a ΔJ Approach for Thermal Fatigue Crack Growth Assessment on the Large Scale Yielding PACIFIC Experiment**

Stéphan Courtin[1], Nicolas Dutruel[1], Gaëlle Leopold Jean-Marie[2], Stéphane Chapuliot[2] - [1]*EDF R&D, ERMES, Palaiseau, France.* [2]*EDF R&D, MMC, Moret-sur-Loing et Orvanne, France*

10.30 am - 11.15 am **Coffee - Exhibition - Poster Session**

Wednesday, November 29th

11.15 am - 12.45 pm

Room 6

S01-1 Additive Manufacturing

2 - Local Fatigue Assessment of Butt-welded Joints between Additively Manufactured 316L Stainless Steel Parts

Moritz Braun[1], Jan Schubnell[2] - *[1]Hamburg University of Technology, Hamburg, Germany. [2]Fraunhofer Institute for Mechanics of Materials, Freiburg, Germany*

5 - Fatigue Strength Assessment of Additive Manufactured Components Considering Local Quality and Geometry using the theory of critical distances and 4R method

Kalle Lipiäinen, Shahriar Afkhami, Antti Ahola, Timo Björk - *LUT University, Lappeenranta, Finland*

51 - Influence of Post-processing Treatments on the Fatigue Behavior of Additively Manufactured Metallic Materials

Alexis Renaud[1], David Maréchal Rolet[1], Jason Rolet[1], Sandy Blanc[2], Loïc Exbrayat[3], Joffrey Tardelli[1] - *[1]IRT-M2P, Metz, France. [2]Safran Additive Manufacturing Campus, Le Haillan, France. [3]Safran Tech, Magny-Les-Hameaux, France*

Room 7

S03-1 Complex Loading

98 - Probabilistic Structural Integrity Assessment of a Floating Offshore Wind Turbine under Variable Amplitude Loading

Baran Yeter, Feargal Brennan - *University of Strathclyde, Department of Naval Architecture, Ocean and Marine Engineering, Glasgow, United Kingdom*

111 - Assessing Fatigue in Materials with Small Defects: a New Multiaxial Model Based on Principal Stress Amplitude

Lucas Carneiro Araujo, José Alexander Araújo - *University of Brasília, Brasilia, Brazil*

61 - Prediction of Mechanical Response due to Creep-fatigue Loading Using Unified Mechanics Theory in Nickel-based Superalloy

Saurabh Mangal[1], Sri Krishna Sudhamsu Kambhammettu[2], C Lakshmana Rao[1] - *[1]Indian Institute of Technology, Madras, Chennai, India. [2]National Institute of Technology, Jamshedpur, India.*

Room 8

S10-1 Fatigue Under Severe Environmental Conditions

101 - Influence of the Interaction Hydrogen/Microstructure on Low-Cycle Fatigue Behavior and Crack Initiation in a Nickel Base Superalloy

Achraf Radi[1,2], Marion Risbet[1], Gilbert Henaff[2], Abdelali Oudriss[3], Romain Chantalat[4], Xavier Feaugas[3] - *[1]UTC, Compiègne, France. [2]ENSMA, Poitiers, France. [3]LaSIE, la rochelle, France. [4]CETIM, Senlis, France*

115 - Carbon Steel Wires Fatigue Assessments for Flexible Pipe Used for Gaseous Hydrogen Transportation

Fagner Fraga[1], Sabesan Thavagunaseelan[1], Florian Bienvenut[1], Romain Chantalat[2] - *[1]TechnipFMC, Le Trait, France. [2]CETIM, Senlis, France*

26 - Phase Field Modelling of Fatigue in Hydrogen Environments

Alireza Golahmar[1,2,3], Christian F. Niordson[1], Emilio Martínez-Pañeda[2] - *[1]Technical University of Denmark, Kgs. Lyngby, Denmark. [2]Imperial College London, London, United Kingdom. [3] Vattenfall Offshore Wind, Copenhagen, Denmark*

Room 9

S04-1 Composites, Elastomers and Adhesive Bonding

92 - Spar Cap/Shear Web Debonding under Fatigue Loading Studied on the DTU 12.6m Wind Turbine Blade

Philipp Ulrich Haselbach, Peter Berring, Sergei Semenov - *Technical University of Denmark, Roskilde, Denmark*

32 - Fatigue Behaviour of 25% wt. Short Glass Fibre Reinforced Recycled Polypropylene Filled with Mineral Filler in Presence of Notches

Andrea Resente[1], Mauro Ricotta[1], Fiorella Trivillin[2], Giovanni Meneghetti[1] - *[1]University of Padova, Padova, Italy. [2]Electrolux Italy S.P.A, Porcia, Italy*

22 - Fatigue Behaviour of Cord Rubber Composite Materials in Air Spring Bellows of Rail Vehicles

Julian Torggler[1], Christian Buzzi[2], Martin Leitner, Tobias Faethe, Heiko Müller - *[1]Graz University of Technology, Graz, Austria. [2]Siemens Mobility GmbH, Graz, Austria. [3]Gummi-Metall-Technik GmbH, Bühl, Germany*

Room 10

S07-1 Experimental and Numerical Design and Validation Methods

79 - Fatigue Design of Chains in Mooring Lines

Bjørn Skallerud[1], Mads Aursand[1], Gunnstein Frøseth[1], Jorge Mendoza[2], Jochen Köhler[1] - *[1]Norwegian Univ Science and Technology, Trondheim, Norway. [2]Equinor, Trondheim, Norway*

127 - Non-Contact Extensometer forDynamic Testing Toward a New Standard for Characterization of Materials inFatigue?

Pascal Daguier - *ZwickRoell France, METZ, France*

107 - Evaluation of the Severity of the Frequency Effect in UFT of Structural Steels

Lewis Milne, Yevgen Gorash, Tugrul Comlekci, Donald MacKenzie - *University of Strathclyde, Glasgow, United Kingdom*

12.45 pm - 2.00 pm Lunch Conference group photo (1.45 pm)

Wednesday, November 29th

2.00 pm - 4.00 pm

Room 6

S02-1 Big Data and Artificial Intelligence

41 - Increasing the Reliability of Industrial Overhead Cranes by Structural Health Monitoring

Jeroen Van Wittenberghe, Vitor Soares Rabelo Adriano, Okan Yilmaz, Filip Van den Abeele - *OCAS NV - ArcelorMittal Global R&D Gent, Zelzate, Belgium*

73 - Impact of Daily and Seasonal Temperature Variation on Rolling Contact Fatigue Damage in the Rail

Olivier Vo Van[1], Vincent Laurent[2,3] - *[1]SNCF SA, Saint-Denis, France. [2]Université Paris-Saclay, Gif-sur-Yvette, France. [3]Eurobios, Cachan, France*

89 - Determination of Stress Concentration Factors of Welded Joints from 3D-surface Scans by Artificial Neural Networks

Öner Aydogan, Matthias Jung, Jan Schubnell - *Fraunhofer Institute of Mechanics of Materials, Freiburg, Germany*

100 - Uncertainty Quantification of the Crack Propagation Behavior in Welded Stiffened Panels Using a Hybrid System Integrating Artificial Neural Networks and Finite Element Analysis

Mohammad Tamimi[1], Mohamed Soliman[2] - *[1]Yarmouk University, Irbid, Jordan. [2]Oklahoma State University, Stillwater, USA*

Room 7

S05-1 Contact Fatigue & Fatigue in Transmission System

130 - Finite Elements Modelling and Assessment of Ceramic Rollers with Edge Cracks

Yuri Kadin, Charlotte Vieillard, Jeroen Wensing, Anand Theerthan - *SKF, RTD, Houten, Netherlands*

59 - Rolling Contact Fatigue Design of Induction Hardened Steels: Experimental Methodology

Guillaume Thoquenne[1], Luc Amar[1], Philippe Amuzuga[2], Albin Ponceau[3] - *[1]CETIM, Senlis, France. [2]CETIM, Saint-Etienne, France. [3]Rollix Defontaine, La Bruffière, France*

57 - In-Situ Image based Crack Measurement Methodology for Gear Single Tooth Bending Fatigue Testing

Isaac Hong, Haelie Egbert, Ahmet Kahraman - *The Ohio State University, Columbus, USA*

64 - Thermal and Thermochemical Treatments against Fretting Failure Applied to Power Transmissions

Luc Amar[1], Yanming Chena[1], Michel Pasquier[2] - *[1]CETIM, Senlis, France. [2]CMD GEAR, Cambrai, France*

Room 8

S06-1 Damage Tolerance and Fatigue Life

66 - Plasticity-Induced Crack Closure in the Presence of Loading Irregularities in Short Cracks Initiated at Interior Defects

Kimmo Kärkkäinen[1], Joona Vaara[2], Miikka Väntänen[3], Tero Frondelius[1,2] - *[1]University of Oulu, Oulu, Finland. [2]Wärtsilä, Vaasa, Finland. [3]Global Boiler Works, Oulu, Finland*

36 - Analysis of Dynamic Features on Local Fatigue Cracks in Steel Bridges

Qingyang Wei[1], Balázs Kövesdi[2], Maosen Cao[1], László Dunai[2] - *[1]Hohai University, Nanjing, China. [2]Budapest University of Technology and Economics, Budapest, Hungary*

88 - Digital Twin for Predicting Progressive Damage in Operating Pressure Vessels

Izat Khaled[1], Mohamed Bennebach[1], Salim Chaki[2], Modesar Shakoor[2], Dmytro Vasiukov[2], Jean-Louis Iwaniack[1], Philippe Rohart[1], Samir Assaf[1] - *[1]CETIM, Senlis, France. [2]IMT Nord Europe, Douai, France*

83 - 3D study of fatigue crack growth with overload effects in AlSi alloy through synchrotron X-ray tomography and digital volume correlation

Lucas Sanciet-Munier[1], Nathalie Limodin[1], Jean-Yves Buffière[2], Jean-François Witz[1], Michel Coret[3], Julien Réthoré[3], Ghita Bahaj Filali[3], Yves Gaillard[4], Michel Fleuriot[4], Joël Lachambre[2], Anne Bonnin[5], Goran Lovric[5], Andrew King[6], Arnaud Weck[7] - *[1]LaMcube, Villeneuve-d'Ascq, France. [2]MATEIS, Villeurbanne, France. [3]GeM, Nantes, France. [4]CETIM - CTIF, Sèvres, France. [5]SLS - Paul Scherrer Institute, Villigen, Switzerland. [6]SOLEIL, Saint-Aubin, France. [7]University of Ottawa - Dpt. of Mechanical Engineering, Ottawa, Canada*

Room 9

S08-1 Fatigue and Manufacturing Process

31 - Analysis of the Uniaxial Fatigue Behaviour of 42CrMo4 Q&T Specimens Extracted from the Big end of a Marine Engine Connecting Rod Using the Heat Energy-Based Approach

Sofia Pelizzoni, Mauro Ricotta, Alberto Campagnolo, Giovanni Meneghetti - *University of Padova, Padova, Italy*

17 - High Cycle Fatigue Performance of Bare 300M Steel by Self-Heating Tests Under Cyclic Loadings

Pierrick Lepitre[1,2], Cédric Doudard[1], Matthieu Dhondt[1], Martin Surand[2], Sylvain Calloch[1] - *[1]ENSTA Bretagne, IRDL UMR CNRS 6027, Brest, France. [2]Safran Landing Systems, Vélizy-Villacoublay, France*

14 - Modelling of Size Effect in Fatigue Strength for Welded Joints Using Effective Notch Stress and Probabilistic Methods

Mehdi Ghanadi[1], Gustav Hultgren[1], Mattias Clarin[2], Zuheir Barsoum[1] - *[1]KTH Royal Institute of Technology, Department of Engineering Mechanics, Stockholm, Sweden. [2]SSAB Special Steels AB, Borlänge, Sweden*

34 - Improved Lifetime Estimation of Shot-Peened Shaft Bores Using a Numerical Approach

Felix-Christian Reissner[1], Lars Uhlmann[2], Jörg Baumgartner[1], Tim Herrig[2], Thomas Bergs[2,3] - *[1]Fraunhofer Institute for Structural Durability and System Reliability (LBF), Darmstadt, Germany. [2]Laboratory for Machine Tools and Production Engineering (WZL), Aachen, Germany. [3]Fraunhofer Institute for Production Technology (IPT), Aachen, Germany*

Room 10

S09-1 Fatigue of Assemblies

11 - Implementation of the Peak Stress Method for the Automated FEA - Assisted Design of Welded joints subjected to Variable Amplitude Multiaxial fatigue Loads

Giovanni Meneghetti[1], Luca Vecchiato[1], Alberto Visentin[1], Daniele Rigon[1], Alberto Campagnolo[1], Vittorio Babini[2] - *[1]Department of Industrial Engineering - University of Padova, Padova, Italy. [2]Antonio Zamperla S.p.a, Vicenza, Italy*

16 - Thick-walled Welded joints in the Range of High Load Cycles - Design of monopiles for offshore Wind Turbines in the Limit Range

Mareike Collmann[1], Stefanie Steppeler[2] - *[1]Leibniz Universitaet Hannover, Hannover, Germany. University of Applied Sciences and Arts Hildesheim/ Holzminden/ Göttingen, Hildesheim, Germany*

49 - Detection and Monitoring of the Fatigue Crack Growth on Welds – Application-Oriented use of NDT methods

Mirjana Ratkovac[1], Paul Gerards-Wünsche[1], Marc Thiele[1], Daniel Brackrock[1], Michael Stamm[1] - *[1]Bundesanstalt für Materialforschung und -prüfung, Berlin, Germany*

116 - Ultrasonic Fatigue Testing of Welds Made of Structural Steels S355JR and S275JR

Yevgen Gorash[1], Tugrul Comlekci[1], Gary Styger[2] - *[1]University of Strathclyde, Glasgow, United Kingdom. [2]Weir Minerals, Johannesburg, South Africa*

Wednesday, November 29th

4.00 pm - 5.00 pm **Coffee - Exhibition - Poster Session**

5.00 pm - 6.30 pm

Room 6

S01-2 Additive Manufacturing

3 - Infrared Imaging Surface Roughness Criticality Assement of Wire Arc Additive Manufactered Specimens

Mathilde Renault[1,2], Lorenzo Bercelli[2], Bruno Levieil[2], Julien Beaudet[1], Cédric Doudard[2], Sylvain Calloch[2] - *[1]Naval Group, Bouguenais, France. [2]IRDL, BREST, France*

119 - Numerical and Experimental Investigations of Wire Arc Additively Manufactured Components Made of 3Dprint AM35 Grade

Burak Karabulut[1], Xiongfeng Ruan[1], Jelena Dobric[2], Barbara Rossi[1,3] - *[1]KU Leuven, Sint-Katelijne-Waver, Belgium. [2]University of Belgrade, Belgrade, Serbia. [3]University of Oxford, Oxford, United Kingdom*

52 - Fatigue Behaviour of Wire Arc Additively Manufactured Sheet Material

Cheng Huang[1], Lingzhen Li[2,3], Niels Pichler[2,3], Elyas Ghafoori[2,3,4], Leroy Gardner[1] - *[1]Imperial College London, London, United Kingdom. [2]Empa, Dübendorf, Switzerland. [3]ETH Zürich, Zürich, Switzerland. [4]Leibniz University of Hannover, Hanover, Germany*

Room 7

S05-2 Contact Fatigue & Fatigue in Transmission System

133 - Characterisation of Cracks Growth and Fatigue Life Distribution Estimation of Carburized Steel

Vincent Argoud[1], Franck Morel[1,2], Etienne Pessard[1], Daniel Bellett[1] - *[1]ENSAM, Angers, France. [2]SAFRAN TECH, Magny-Les-Hameaux, France*

117 - A Hybrid ANN Multiaxial Fatigue Model for the Assessment of Fretting Fatigue under Variable Amplitude Shear Loading

Giorgio Brito Oliveira[1], Raphael Cardoso[2], Raimundo Freire Júnior[2], José Araújo[1] - *[1]University of Brasilia, Brasilia, Brazil. [2]Federal University of Rio Grande do Norte, Natal, Brazil*

60 - The Influence of Shot Peening on Gear Teeth Micropitting and Contact Fatigue Failure

Dalia Jbily[1], Fabien Lefebvre[2], André Simonneau[1] - *[1]CETIM, Senlis, France. [2]TEXELIS, Limoges, France*

Room 8

S07-2 Experimental and Numerical Design and Validation Methods

42 - Nominal Stresses in Continuous and Intermittent Rail Welds of Crane Runway Beams

Elena Sidorov, Mathias Euler - *Brandenburg University of Technology, Cottbus, Germany*

63 - Fatigue Strength of Synthetic Rope

Francis Blanc[1], Antoine Nicolle[1], Yan-Ming Chen[1], Sophie Toillon-Rey Flandrin[1], Fabien Lefebvre[1], Jérémy Blasiak[2], Olivier Gay[2], Frédéric Fayolle[3], Vincent Leray[4], Arnaud Miton[3] - *[1]CETIM, Senlis, France. [2]MANITOWOC Cranes, Dardilly, France. [3]REEL, Saint-Cyr-au-Mont-d'or, France. [4]NOV BLM, Carquefou, France*

54 - Study and Modeling of Fatigue Properties at Very Large Cycles from Self-heating Tests under Cyclic Loads

Théo Sévédé, Shabnam Arbab Chirani, Younes Demmouche, Sylvain Calloch - *IRDL, Brest, France*

Room 9

S08-2 Fatigue and Manufacturing Process

56 - Numerical and Experimental Fatigue Strength Evaluation of Thin-Walled Aluminum Components for Aerospace Application Manufactured by Roll Forming

Boris Spak, Markus Kästner - *Technische Universitaet Dresden, Dresden, Germany*

47 - Stress Ratio Effect on the Fatigue of Welded Joints Assessed via Thermoelastic Stress Analysis

Bruno Levieil[1], Corentin Guellec[1], Lorenzo Bercelli[1], Cédric Doudard[1], Sylvain Calloch[1], Florent Bridier[2] - *[1]ENSTA Bretagne, Brest, France. [2]Naval Group Research, Bouguenais, France*

97 - Gigacycle Fatigue Performance of Structural Steel Welds

Andrew England, Athanasios Toumpis, Yevgen Gorash - *Department of Mechanical and Aerospace Engineering, University of Strathclyde, Glasgow, United Kingdom*

Room 10

S09-2 Fatigue of Assemblies

48 - New Developments on Fatigue Verification in Eurocode on Steel Structures

Mladen Lukić[1], Mathias Euler[2], Alain Nussbaumer[3], Marion Rauch[4] , David Pope[5] - *[1]CTICM, Saint-Aubin, France. [2]Brandenburgische Technische Universität, Cottbus, Germany. [3]EPFL, Lausanne, Switzerland. [4]Hochschule Kaiserslautern, Kaiserslautern, Germany. [5]Carba Consulting Ltd., London, United Kingdom*

27 - Multiaxial Fatigue on Cableway Installations Components: Use of the Dang Van Criterion Based on Detail Categories of EN_1993-1-9 Standard

Benjamin Causse[1], Rémy Bernot[1], Noé Poyet[1,2], Françoise Fauvin[2], Pierre-Henri Manioulox[3], Nicolas Fleurisson[4], Jean-Christophe Roux[2], Eric Feulvarch[2] - *[1] STRMG, Grenoble. [2]Ecole Centrale de Lyon, LTDS UMR5513, ENISE, St-Etienne. [3]CETIM, Saint-Etienne, France. [4]GMM, Saint-Martin le vinoux, France*

150 - Recent Update of the IIW-recommendations for Fatigue Assessment of Welded Joints and Components

Jörg Baumgartner[1], A. Hobbacher[2], Fabien Lefebvre[3] - *[1]LBF, Darmstadt, Germany. [2]Jade Hochschule, Wilhelmshaven, Germany. [3]CETIM, Senlis, France*

7.00 pm - 11.00 pm **Gala evening in Fontaine-Chaalis, diner at the Chaalis Abbey**

Thursday, November 30th

8.30 am - 10.00 am

Room 6

S01-3 Additive Manufacturing

65 - Fatigue Durability of Inconel 718 Obtained by Additive Layer Manufacturing Route

Cesar-Moises Sanchez-Camargo[1], Yves Nadot[1], Jonathan Cormier[1], Fabien Lefebvre[2] , Robin Hauteville[2], Wen Hao Kan[3], Louis Ngai Sum Chiu[3], Chen Li[3], Aijun Huang[3] - *[1]Institut P', Futuroscope, France. [2]CETIM, Senlis, France. [3]MCAM, Monash, Australia*

91 - Numerical Estimation of Fatigue Life Scatter in Micro-sized Electron Beam Melted Parts Using Machine Learning Technique

Yixuan Hou, Reza Talemi - *KU Leuven, Gent, Belgium*

125 - Effect of Re-lasing on the Fatigue Properties of 316L Stainless Steel Produced by Laser Powder Bed Fusion

Foued Abroug[1], Yunran Ma mayunran[1], Morgane Mokhtari[1], Lionel Arnaud[1], Anis Hor[2], Clément Keller[1] - *[1]Laboratoire Génie de Production (LGP), Université de Toulouse, INP-ENIT, Tarbes, France. [2]Institut Clément Ader (ICA), Université de Toulouse, CNRS, ISAE-SUPAERO, Toulouse, France*

Room 7

S07-3 Experimental and Numerical Design and Validation Methods

39 - A Simplified Fracture Mechanics Method for Fatigue Life Analysis of Weld Roots

Magnus Andersson, Per-Olof Danielsson - *Volvo CE, Braås, Sweden*

12 - New Test-based Detail Categories for Fatigue Design of Crane Runway Beams

Mathias Euler - *Brandenburg Technical University, Cottbus, Germany*

84 - Integration of Fatigue Analysis in FEM Solver for Faster more Reliable Process

Michael Klein[1], Jacques Marchesini[2], Laurent Dastugue[2] - *[1]INTES GmbH, Stuttgart, Germany. [2]INTES France, Rambouillet, France*

Room 8

S08-3 Fatigue and Manufacturing Process

77 - Life-Cycle Cost Assessment of Post Weld Treatments: Effect of Local Weld Geometries

Kaushik Iyer, Zuheir Barsoum, Malin Åkermo - *KTH Royal Institute of Technology, Stockholm, Sweden*

82 - Study of Crack Growth Behaviour in a Cast Magnesium Alloy

Hayder Ahmad, Mark Craig, Barry Luckett - *Safran Electrical & Power, Pitstone, Buckinghamshire, United Kingdom*

93 - Numerical Study on Effects of Microstructure Randomness on Fatigue Fracture of Non-Oriented Electrical Steels

Sanjay Gothivarekar, Grzegorz Glodek, Reza Talemi - *KU Leuven, Gent, Belgium*

Room 9

S09-3 Fatigue of Assemblies

67 - Fatigue Assessment of Fillet Welded Doubling Plates Using Different Methods

Inge Lotsberg, Wenbin Dong - *DNV, Oslo, Norway*

45 - Influence of Preload on Fatigue Behaviour of Welded Joints

Isabel Huther[1], Laurent Jubin[1], Lauriane Guilmois[1], Théo Leblanc[1], Fabien Lefebvre[1], Vincent Leray[2] - *[1]CETIM, Nantes, France. [2]NOV-BLM, Carquefou, France*

104 - Investigation of the Fatigue Strength of Shape Optimized Gusset Plates in Rectangular and Circular Hollow Section K-Joints

Philipp Ladendorf[1], Stefan Herion[1], Matthias Winkler[2], André Dürr[2] - *[1]Centre of Competence for Tubes and Hollow Sections CCTH, Karlsruhe, Germany. [2]Institute for Material and Building Research, University of Applied Sciences Munich, München, Germany*

Room 10

S11-1 Non-linear behavior and cumulative damage

29 - Fatigue Life Estimation Applying the Local Strain Concept Based on the Local Cyclic Material Behavior of a Steering Knuckle

Ahmad Qaralleh[1], Andreas Maciolek[1], Benjamin Möller[1], Jan Weichert[2], Tobias Melz[1] - *[1]Fraunhofer Institute for Structural Durability and System Reliability LBF, Darmstadt, Germany. [2]Research group System Reliability, Adaptive Structures, and Machine Acoustics, Darmstadt, Germany*

81 - Cyclic Mechanical Behavior of Electro-Welded Meshes Used as Structural Reinforcement

Camilo Gonzales Olier[1,2], Carlos Arteta Torrents[2], Michael Miranda Giraldo[2], Habib Zambrano Rodriguez *[1]Universidad Simon Bolivar, Barranquilla, Colombia. [2]Universidad del Norte, Barranquilla, Colombia*

110 - An Overview of the Mechanism-Based Thermo-Mechanical Fatigue Method (DTMF) and its Application in the Design of Automotive Components

Giovanni Teixeira - *Dassault Systemes UK, Sheffield, United Kingdom*

10.00 am - 10.45 am Coffee - Exhibition - Poster Session

Thursday, November 30th

10.45 am - 12.15 pm

Room 6

S01-4 Additive Manufacturing

76 - Self-Heating Testing of Additively Manufactured Ti-6Al-4V with Different Microstructures and Porosity Levels

Vincent Bonnand[1], Brot Grégoire[1,2], Imade Koutiri[2], Véronique Favier[2], Nicolas Ranc[2], Corinne Dupuy[2], Fabien Lefebvre[3], Robin Hauteville[3] - *[1]DMAS, ONERA, Université Paris Saclay, Châtillon, France. [2]PIMM, Arts et Metiers Institute of Technology, CNRS, Cnam, HESAM University, Paris, France. [3]CETIM, Senlis, France*

90 - Ti-6Al-4V L-PBF Chemically Etched Components: from the Surface Micro-geometric Characteristics to the Fatigue Strength

David Mellé[1,2], Etienne Pessard[1], Franck Morel[1], Daniel Bellett[1], René Billardon[3] - *[1]LAMPA, HESAM University, Arts et Métiers Campus d'Angers, Angers, France. [2]Safran Tech, Materials and Processes department, Magny-les-Hameaux, France. [3]Safran Transmission Systems, Colombes, France*

108 - Multiaxial Fatigue Analysis of Additively Manufactured Hollow Specimens from AlSi10Mg

Jan Papuga[1], Luis Reis[2], Martin Matušů[1], Pedro Costa[2], Jan Šimota[1], Jakub Rosenthal[3], Francisco João Bumba Paca[2] - *[1]Czech Technical University in Prague, Prague, Czech Republic. [2]Instituto Superior Técnico - University of Lisbon, Lisbon, Portugal. [3]OTH Amberg-Weiden, Amberg, Germany*

Room 7

S07-4 Experimental and Numerical Design and Validation Methods

74 - Fatigue Crack Growth and Closure: Effect of Load Ratio and Specimen Geometry

Théotime Asselin[1,2], Gilbert Hénaff[2], Olivier Ancelet[1], Guillaume Benoit[2] - *[1]Framatome, Courbevoie, France. [2]Institut P', Chasseneuil du Poitou, France*

50 - The Effect of Heat Treatment on Fatigue Strength of Additively Manufactured AlSi10Mg

Martin Matušů[1], Jan Papuga[1], Jakub Rosenthal[2], Jan Šimota[1], Libor Beránek[1], Ludmila Růžičková[1] - *[1]CTU in Prague, Prague, Czech Republic. [2]OTH Amberg-Weiden, Amberg, Germany*

129 - Exploration of the Orientational Dependent Fatigue Response of Triply Periodic Minimal Surface Cellular Structures: a Numerical Study

Sudeep Kumar Sahoo, Nicolas Saintier, Yves Chemisky - *Université de Bordeaux, Laboratoire I2M, UMR CNRS 5295, Arts et Métiers Institute of Technology, Talence, France*

Room 8

S08-4 Fatigue and Manufacturing Process

112 - Analysis of the Effect of "Large" Internal Defects on the Fatigue Strength of the G20Mn5-QT Cast Steel Alloy

Pierre Osmond[1], Driss El Khoukhi[1], Bhimal Bholah[1], Benaouda Abdellaoui[2], Guillaume Le Breton[3], Gilles Regheere[3] - *[1]CETIM, Senlis, France. [2]CETIM, Saint Etienne, France. [3]CTIF, Sèvres, France*

58 - Various Influences on the Fatigue Resistance of Important Steel Details

Gloria Hofmann[1], Helen Bartsch[2], Ulrike Kuhlmann[1], Markus Feldmann[2] - *[1]University Stuttgart, Insitut of structural design, Stuttgart, Germany. [2]RWTH Aachen, Institute for Steel and Lightweight metal construction, Aachen, Germany*

135 - Fatigue Assessment of Defective A 357-T6 Cast Aluminum Based on Affected Depth

Nesrine Majed, Marwa Youssef, Anouar Nasr - *National engineering school of Monastir, Monastir, Tunisia*

Room 9

S09-4 Fatigue of Assemblies

70 - Fatigue Strength of Adhesively Bonded Deep Drawn Sheet Specimens Under Multiaxial Loading with Variable Amplitudes

Matthias Hecht[1], Jörg Baumgartner[2] - *[1]Technical University of Darmstadt, Darmstadt, Germany. [2]Fraunhofer LBF, Darmstadt, Germany*

37 - Damage Modelling of Structural Adhesive Under Cyclic Sollicitations: Automotive Application

Sidonie Pinaroli[1], Véronique Favier[1], Katell Derrien[1], Léo Morin[2], Anthony Reullier[3] - *[1]ENSAM, Paris, France. [2]Université de Bordeaux, I2M, Bordeaux, France. [3]Renault SA, Guyancourt, France*

105 - A Practical Methodology for the Fatigue Life Estimation of Adhesive Joints

Cristian Bagni, Andrew Halfpenny, Michelle Hill - *Hottinger Bruel & Kjaer UK Ltd, Rotherham, United Kingdom*

Room 10

S13-1 Vibration Fatigue

44 - Fatigue life Assessment of a Slender Lightning Rod Due to Wind Excited Vibrations

Andi Xhelaj[1], Andrea Orlando[1], Luisa Pagnini[1], Federica Tubino[1], Maria Pia Repetto[3] - *[1]Department of Civil, Chemical and Environmental Engineering, University of Genoa, Genoa, Italy*

7 - Investigation of an Automotive Subsystem Submitted to Vibration Loads Considering Scatter of Influence Parameters

Sven Maier[1], Florian Bachmann[2] - *[1]TU Darmstadt, Darmstadt, Germany. [2]BMW Group, Munich, Germany*

21 - Fatigue Simulations for Automotive Components Undergoing Vibration Loadings: Effect of Non-Linear Behavior

Maciej Majerczak[1], Ewelina Czerlunczakiewicz[1], Marco Bonato[2] - *Valeo Thermal Systems Poland, Skawina, Poland. Valeo Thermal Systems France, La Verrière, France*

12.15 pm - 1.30 pm Lunch

Thursday, November 30th

1.30 pm - 3.30 pm

Room 6

S06-2 Damage Tolerance and Fatigue Life

123 - Active Thermography Techniques for the Analysis of Residual Stresses in Materials and Components

Francesca Curà, Raffaella Sesana, Luca Corsaro - *Politecnico di Torino, Torino, Italy*

124 - Measuring Mechanical Properties and Residual Lifetime by Micro-sampling & Fractography

Laurent Ponson - *Tortoise, Paris, France. CNRS-Sorbonne Université, Paris, France*

18 - Residual Life Assessment of Deep Rolled Railway Axles Considering the Effect of Process Parameters

Tobias Pertoll[1], Christian Buzzi[1], Martin Leitner[1], David Simunek[2], László Boronkai[2]- *[1]Graz University of Technology, Institute of Structural Durability and Railway Technology, Graz, Austria. [2]Siemens Mobility Austria GmbH, Graz, Austria*

114 - Local Relaxation of Residual Stress in HFMI-treated High-strength Steel Welded Joints Subjected to High-peak Loads

Yuki Ono[1], Heikki Remes[1], Koji Kinoshita[2], Halid Can Yıldırım[3], Alain Nussbaumer[4] - *[1]Aalto University, Espoo, Finland. [2]Gifu University, Gifu, Japan. [3]Aarhus University, Aahus, Denmark. [4]Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland*

Room 7

S08-5 Fatigue and Manufacturing Process

86 - The Effect of the Microstructure on Torsional Fatigue Crack Initiation and Propagation Mechanisms in the Cast AlSi7Mg0.3 Aluminium Alloy Using in-situ 3D X-ray CT and Diffraction Contrast Tomography in a Synchrotron Beamline

Franck Morel[1], Viet-Duc Le[1], Jean-Yves Buffière[2], Nicolas Saintier[1], Pierre Osmond[3], Daniel Bellett[1] - *[1]Arts et Métiers Institute of Technology, Angers, France. [2]INSA de Lyon, Lyon, France. [3]CETIM, Nantes, France*

46 - Effect of Local Weld Geometry and its Variability on the Local Weld Stress

Gustav Hultgren, Zuheir Barsoum - *KTH Royal Institute of Technology Department of Engineering Mechanics, Stockholm, Sweden*

68 - Effect of the Grain Boundary on the Fatigue Crack Growth for Aluminium Bi-crystals

Wilmer Velilla-Díaz[1], Habib Zambrano[2] - *[1]Universidad Austral de Chile, Valdivia, Chile. [2]Universidad del Norte, Barranquilla, Colombia*

35 - Hole-making and Cutting Effects on Fatigue Performance of Ultra High strength steels

Okan Yilmaz, Dennis Van Hoecke - *ArcelorMittal Global R&D Gent. OCAS NV, Zelzate, Belgium*

Room 8

S09-5 Fatigue of Assemblies

4 - Life Extension of Pre-Damaged Existing Crane Runway Girders

Matthias Winkler, André Dürr - *Munich University of Applied Sciences , Munich, Germany*

10 - Fatigue Strength Assessment of Aluminium Welded Joints under Variable Amplitude Loading using the Peak Stress Method

Luca Vecchiato, Alberto Campagnolo, Giovanni Meneghetti - *University of Padova, Padova, Italy*

13 - Experience with the Use of the HFMI Method for Weldments from Sheets of Different Thicknesses

Miloslav Kepka, Jan Tittel - *University of West Bohemia in Pilsen, Pilsen, Czech Republic*

122 - 3D Numerical Simulation of Fatigue Crack Growth in Welded Connections of Gantry Cranes for Residual Life Assessment

Marwa Dhahri[1], Stephane Kemgang[2], Bhimal Bholah[2], Isabel Huther[2], Bruno Depale[2], Delphine Brancherie[1], Piotr Brietkopf[1] - *[1]UTC, Compiègne, France. [2]CETIM, Senlis, France*

Room 9

S10-2 Fatigue Under Severe Environmental Conditions

20 - Rapid Estimation of Fatigue Properties of High Temperature Materials Using Self-Heating Tests

Alexis Mion[1,2], Cédric Doudard[1], Jonathan Cormier[3], Vincent Roué[2], Dimitri Marquié[2], Sylvain Calloch[1] - *[1]IRDL, Brest, France. [2]Safran Aircraft Engines, Villaroche, France. [3]Institut Pprime, Chasseneuil-du-Poitou, France*

38 - Effects of High Energy Laser Peening Followed by Pre-Hot Corrosion on Stress Relaxation, Microhardness and Fatigue Life and Strength of Single Crystal Nickel CMSX-4® Superalloy

Lloyd Hackel - *Curtiss Wright Surface Technologies - Metal Improvement Company, Livermore, USA*

53 - Fatigue Methodology for the Qualification of Polymer Grades Used as Pressure Sheaths and Sealed Outer Sheaths in Unbonded Flexible Pipes for the Offshore Oil & Gas Industry

Laetitia Fraisse, Yann Chevalon, Thomas Iversen, Christian Wang - *NOV Flexibles, Brøndby, Denmark*

149 - Fatigue Crack Acceleration in Martensitic steels under High-pressure Hydrogen

Hisao Matsunaga - *Kyushu University, Fukuoka, Japan*

Room 10

S12-1 Reliability–based approaches and probabilistic methods

43 - Probabilistic Inspection Planning for Fatigue Cracks in Floating Production, Storage, and Offloading Units

Arne Fjeldstad[1], Frode Bratbak[1] - *[1]DNV, Oslo, Norway*

103 - Reliability–Based Approaches and Probabilistic Methods

Amaury Chabod[1], Tudor Miu[2], Balaje Thumati[1] - *[1]Hottinger Bruel & Kjaer France SAS, Sucy-en-Brie, France. [2]Hottinger Bruel & Kjaer UK Ltd., Rotherham, United Kingdom*

96 - Enhancement of Fatigue Life Modeling Using a Metamodel-Based Global Sensitivity Analysis Framework

Khashayar Shahrezaei[1,2], Sara Eliasson[1,2,3], Per Wennhage[1,2], Zuheir Barsoum[1] - *[1]KTH Royal Institute of Technology, Department of Engineering Mechanics, Stockholm, Sweden. [2]The Centre for ECO2 Vehicle Design, Stockholm, Sweden. [3]Scania CV AB, Södertälje, Sweden*

85 - Pratical use of Data Lake for Better Fatigue Life Estimation

Amaury Chabod[1] - *[1]Hottinger Bruel & Kjaer France SAS, Sucy-en-Brie, France*

Thursday, November 30th

3.30 pm - 4.15 pm — **Coffee - Exhibition - Poster Session**

4.15 pm - 6.00 pm — **Plenary Session**

143 - Responsible Fatigue Design of Components under Multiaxial Loading

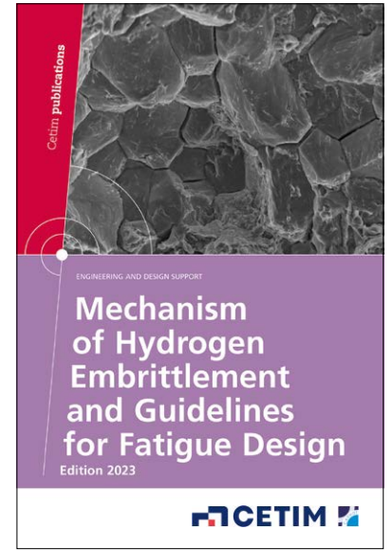
Jan Papuga - *Czech Technical University in Prague, Prague, Czech Republic*

8 - Generalized Modelling Approach to Predict Short and Long Fatigue Crack Propagation Behaviors

Ayhan Ince - *Concordia University, Montreal, Canada*

6.00 pm — **End of the Congress**

Mechanism of Hydrogen Embrittlement and Guidelines for Fatigue Design



In 2012, Japanese researchers published a reference book entitled Mechanism of Hydrogen Embrittlement and Guidelines for Fatigue Design.
This book provides a detailed explanation of hydrogen embrittlement with numerous application examples and fatigue design guidelines.
Professor Yukitaka Murakami, one of the main authors of the Japanese version of this book, emeritus professor of the Kyushu University and Honoris Causa of INSA Lyon, first director of the Research Center for Hydrogen Industrial Use and Storage (Hydrogenius) in Kyushu, did the honor of putting Cetim in touch with the publisher of the Japanese version of the book, Mr. Masashi Oikawa from YOKENDO LTD. This has enabled the production of two translated versions, one in French and this present publication in English. These two versions are a faithful translation of the Japanese version so as not to betray the original spirit.
After the publication of several guidelines on fatigue dedicated to the mechanical sector, Cetim at present, by means of this book, intends to actively participate in the diffusion of such knowledge on an international level. With particular concern for a global issue, that of reducing greenhouse gas emissions.
Hydrogen represents, for this purpose, a promising solution for industrial processes, transport or energy production given the current energy and ecological challenges.
Enjoy your read…

Order the book

CONTACT
Answer and Question Service
Séverine Duarté
sqr@cetim.fr

CETIM

Poster Session

15 - Fatigue calculation at hot spots in cope hole welded details using finite element analysis

Kashif Toor[1], Inge Lotsberg[2] - *[1]Vattenfall, Kolding, Denmark. [2]DNV, Oslo, Norway*

19 - Influence of shear cut holes on the fatigue performance of hot-rolled 800 MPa automotive steel grades

Kalle Lipiäinen[1], Pekka Plosila[2], Antti Kaijalainen[2], Antti Ahola[1], Timo Björk[1] - *[1]LUT University, Lappeenranta, Finland. [2]University of Oulu, Oulu, Finland*

23 - A pragmatic method to account for seismic stress cycles contribution in fatigue assessment compliant with RCCM French design code.

Sandy Limouzi - *Technicatome, Aix en Provence, France*

25 - System Reliability - eDrive

Karthik Krishnasamy - *Valeo, Amiens, France*

28 - Equivalence of Vibration Signals for Fatigue Simulation. Effect of parameters on durability predictions.

Marco Bonato[1], Renan Leon[1], Karthikeyan Sridhar[2], Arumugapandian Duraipandi[2] - *[1]Valeo Thermal System, La Verrière, France. [2]Valeo, Chennai, India*

30 - Fatigue assessment of steel tube-to-flange welded joints with reinforcement ribs subjected to multiaxial loads according to the Peak Stress Method

Alberto Visentin[1], Alberto Campagnolo[1], Vittorio Babini[2], Giovanni Meneghetti[1] - *[1]Department of Industrial Engineering, University of Padova, Padova, Italy. [2]Antonio Zamperla S.p.A., Altavilla Vicentina, Italy*

33 - Fatigue behavior of a nodular cast iron subjected to a variable amplitude strain-based load spectrum applied in bench tests of an Off-highway axle

Alberto Campagnolo[1], Carlo Dengo[2], Jacopo Pelizzari[1,2], Giovanni Meneghetti[1] - *[1]University of Padova, Padova, Italy. [2]Carraro S.p.a., Campodarsego, Italy*

55 - Influence of temperature on tensile and fatigue behavior of premium quality Inconel 718

Lyne Meouchy[1,2], Manuel Paredes[1], Alain Daidie[1], Christian Paleczny[2], Pauline Girot-Person[3] - *[1]Institut Clément Ader (ICA), Université de Toulouse, INSA, IMT MINES ALBI, ISAE-SUPAERO, UT III, CNRS, Toulouse, France. [2]Safran Aircraft Engines, Villaroche, France. [3]Safran Helicopter Engines, Bordes, France*

69 - FEA Design optimization for Mining Excavators based on field measurements

Farid Ahdad, Theo Citerne - *Liebherr Mining, Colmar, France*

78 - Numerical investigation of the influence of defects on the multiaxial fatigue behaviour of additively manufactured alloys

Sai Sreenivas Penkulinti[1], Matthieu Bonneric[1], Nicolas Saintier[1], Benoit Verquin[2], Fabien Lefebvre[3], Pascal Ghys[4], Thierry Palin-Luc[1] - *[1]I2M Bordeaux, ENSAM, Bordeaux, France. [2]CETIM, Saint-Étienne, France. [3]CETIM, Senlis, France. [4]ALSTOM, Saint-Ouen, France*

80 - Numerical modeling of high-frequency fatigue testing for short crack propagation from tailored defect.

Marie Bouyx[1,2], Chiaruttini Vincent[1], Vattré Aurélien[1], Vincent Bonnand[1], Antoine Blanche[3] - *[1]ONERA, Châtillon, France. [2]Ecole Centrale Nantes, Nantes, France. [3]SAFRAN, Villaroche, France*

87 - Mitigating the risk for creep-fatigue cracking in steam turbine rotors: an end user's perspective

Malik Spahic, Dario Guarino, Clément Brichart, Dieter Billet, Frits Petit - *Engie Laborelec, Linkebeek, Belgium*

88 - Digital Twin for Predicting Progressive Damage in Operating Pressure Vessels

Izat Khaled[1], Mohamed Bennebach[1], Salim Chaki[2], Modesar Shakoor[2], Dmytro Vasiukov[2], Jean-Louis Iwaniack[1], Philippe Rohart[1], Samir Assaf[1] - *[1]CETIM, Senlis, France. [2]IMT Nord Europe, Douai, France*

94 - An Additive Manufacturing database to support the development of Metal AM applications

Benaouda Abdellaoui, Pierre Auguste, Nicolas Bachelard, Adrien Barroux, Bhimal Bholah, Mohammed Amine Cheikh, Karim Cheikh, Lucie Demaret, Caroline Depredurand, Julius Domfang Ngnekou, Florence Dore, Nadège Ducommun, Driss El Khoukhi, Robin Hauteville, Yassine Hfidh, Alexian Juin, Mathilde Labonne, Clément Laleve, Pauline Leborgne, Pierre Osmond, Maxime Robert, Hervé Rognon, Quentin Saby, Socona Traore, Benoit Verquin - *CETIM, Senlis, France*

99 - Elastoplastic behavior of 316L stainless steel (SS) and the analysis of the Ratcheting phenomenon under cyclic loading

Aboussalih Amira[1], Zarza Tahar[2], Fedaoui Kamel[1] - *[1]L'institut des Sciences Techniques Appliquées (ISTA) l'université Constantine 1., Constantine, Algeria. [2]Civil engineering Constantine 1 University, Constantine, Algeria*

102 - Effects of pre-strain, surface condition and residual stresses on the structural fatigue damage of wheel bearings: implementation of a numerical workflow from the manufacturing processes to the fatigue resistance

Vo-Huu-Thuc Nguyen[1,2], Etienne Pessard[2], Franck Morel[2], Daniel Bellett[2], Viet-Duc Le[2], Sébastien Guillaume[1] - *[1]NTN-SNR, Annecy, France. [2]Arts et Metiers Institute of Technology, LAMPA, Angers, France*

106 - A pragmatic approach for the fatigue life estimation of hybrid joints

Cristian Bagni, Andrew Halfpenny, Michelle Hill - *Hottinger Bruel & Kjaer UK Ltd, Rotherham, United Kingdom*

118 - Effects of hydrogen on fatigue properties of austenitic stainless steels at low temperature

Romain Chochoy[1], Gilbert Hénaff[1], Pierre Osmond[2], Denis Bertheau[1], Guillaume Benoit[1] - *[1]Institut Pprime, Poitiers, France. [2]CETIM, Nantes, France*

121 - Application of self-heating measurement under cyclic loads in quality control process

Nicolas Graux[1], Malpe Aditi Bhat[1], Marion Risbet[2], Walid Harizi[2], Zoheir Aboura[2] - *[1]Poclain Hydraulics, Verberie, France. [2]Université de technologie de Compiègne, Alliance Sorbonne université, laboratoire Roberval, Centre de recherche Royallieu, Compiège, France*

131 - Assessment method for fatigue regarding existing motorway bridges made of weathering steel

Jacques Berthellemy - *Cerema, Champs-sur-Marne, France*

132 - Considerations regarding the fatigue design of the steel bridges

Jacques Berthellemy[1], Franziska Schmidt[2], Guillaume Bianne[2], Grégoire Leclerc[2] - *[1]Cerema, Champs-sur-Marne, France. [2]Uni. Gustave Eiffel, Champs-sur-Marne, France*

Practical Information

Best Poster Award
At the CETIM Entrance Hall

Discover the 2023 poster selection and vote for your best poster **before 10.30 am, November 30th**
Award Ceremony November 30th at 1.45 pm

Pictures of the Congress

Conference group photo
November 29th at 1.45 pm in front of the CETIM *(near the poster session)*

Discover all the photos on our photo gallery
fatiguedesign.org/photo-gallery

Business Room

A business room is available in free access if you need a quiet space to work. You can find it in front of the conference room 6

Speaker Desk

If you are a speaker and have a question or if you need to provide us with your updated presentation (on USB key), reach the speaker desk. It is located next to the conference room 6

Shuttle Schedules

Wednesday, November 29th

Morning shuttle from the Senlis hotels to CETIM
Details:

7.55 am	**Departure from Escapade Best Western Hotel**
8.05 am	**Departure from Ibis and Campanile Hotels**
8.15 am	**Final stop at CETIM**
6.30 pm	**Shuttle from CETIM to Fontaine-Chaalis**
11.00 pm	**Shuttle from the gala venue to the Senlis hotels**

Thursday, November 30th

Morning shuttle from the Senlis hotels to CETIM
Details:

7.55 am	**Departure from Escapade Best Western Hotel**
8.05 am	**Departure from Ibis and Campanile Hotels**
8.15 am	**Final stop at CETIM**
6.00 pm	**Shuttle from CETIM to Roissy Charles de Gaulle airport**

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

Gala Evening in Fontaine-Chaalis November 29th

7.00 pm - 11.00 pm Social Event
Gala evening
in Fontaine-Chaalis

11.00 pm Departure to the hotels

A dinner at the 3rd favourite monument of France chosen by the French

Book your Taxi

A hostess is at your disposal to make reservations

Please submit your request before 1.30 pm (Thursday 30th)

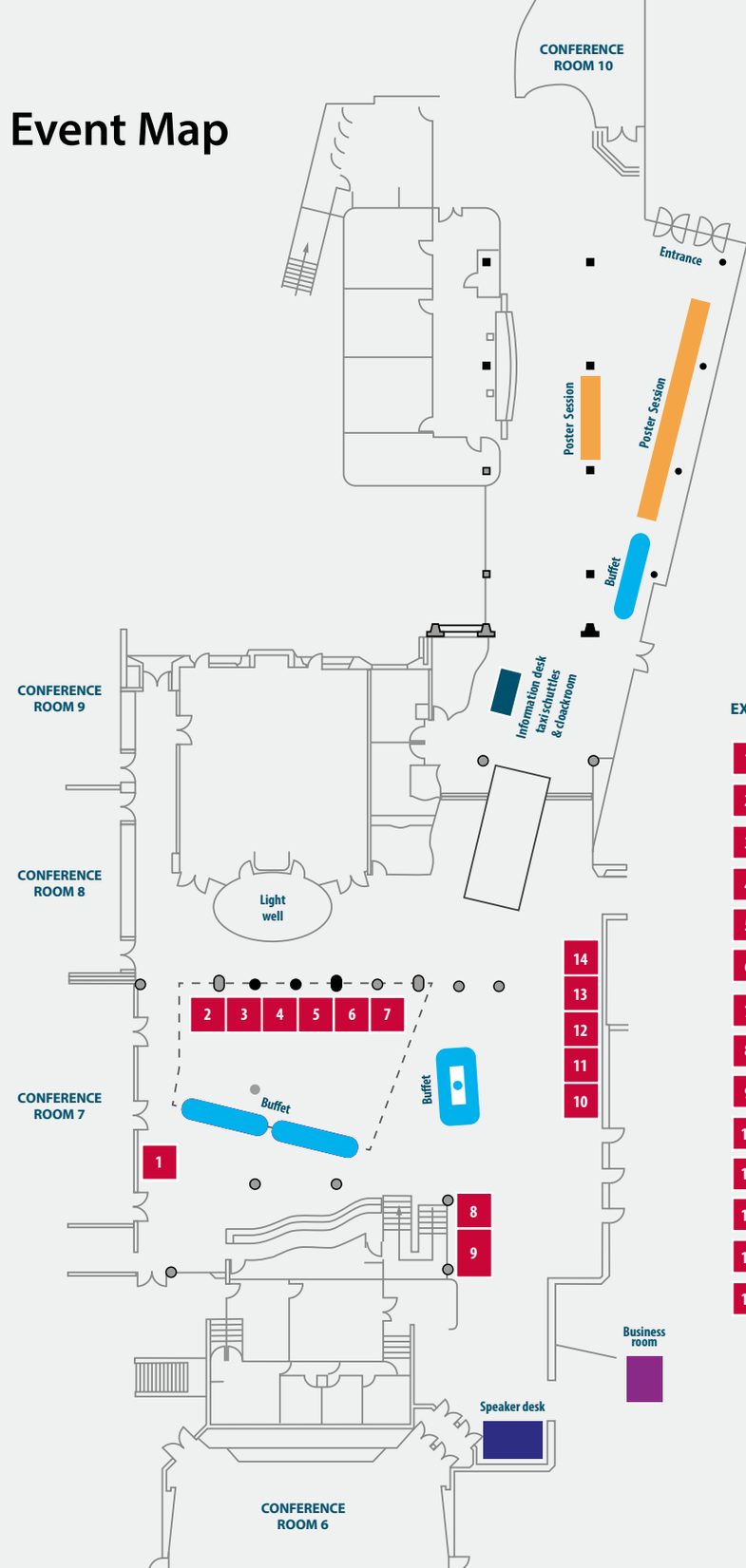
Free and Unlimited WiFi Access

Connect you to the **"CETIM-Public"** network

Satisfaction Survey

Give us your feedback in just 1 minute! Thank you!

Event Map



EXHIBITORS:

1. STEPLAB
2. RUMUL
3. INTES
4. EASI-STRESS
5. HEXAGON
6. Mecatest
7. 3R
8. MRX
9. CETIM + Misulab
10. HBK
11. BETA CAE Systems International AG
12. UTC Compiegne
13. Eikosim
14. MTS

10th fatigue design

Location
CETIM - 52 avenue Félix-Louat
60300 Senlis - France

Access
25 km drive from the Paris
Charles-de-Gaulle airport,
direct access through the A1 highway, exit 8

Contact
fatiguedesign@cetim.fr
+33 (0)9 70 82 16 80

Information & Registration
fatiguedesign.org

CETIM

Sponsors

HBK HOTTINGER BRÜEL & KJÆR

MR RAYS