

Content

Plenary session

S1.1 - APPRoFi project - Probabilistic methods for the reliability assessment of structures subjected to fatigue

N. Gayton (IFMA), M. Afzali (Cetim), A. Bignonnet (AB Consulting), P-A. Boucard (ENS Cachan/LMT), G. Defaux (Phiméca), J-L. Dulong (UTC), B. Echard (Ifma), A. Ghouali (Snecma/Vernon), F. Lefebvre (Cetim), M. Masmoudi (Modartt), A. Otsmane (Snecma/Villaroche), A. Pyre (Snecma/Vernon), N. Relun (ENS Cachan/LMT), M. Lemaire (IFMA), A. Notin (UTC), D. Neron (ENS Cachan/LMT)

S1.2 - The influence of semi-active dampers on the loads of passenger cars

S. Schneider, D. Brechter, A. Janßen, H. Mauch (Volkswagen AG, Wolfsburg), C. Bohn (Clausthal University of Technology)

S1.3 - Influence of frequency and stress concentration on fatigue behaviour of short glass-fibre reinforced polyamides

J. Hartmann (LBF), M. Monin, A. Marie Louise (PSA Peugeot Citroën), D. Ayglon (Du Pont International Operations Sarl), P. Robichon, E. Limousin (Mann + Hummel France), F. Gerard, F. Naudin, D. Guyon (Mark IV Systèmes Moteurs S.A), A. Launay, I. Raoult (PSA Peugeot Citroën), A. Büter, C.M. Sonsino (LBF)

S2.1 - Mechanical behavior and damage of tridimensional multilayeredceramics-tungsten power electronic substrates

C. Robert, S. Pommier (LMT-Cachan, ENS Cachan), S. Lefebvre (SATIE, ENS Cachan), M. Massiot, M. Ortali (Egide, EGIDE Bollène)

S2.2 - A Probabilistic Multiaxial Two-Scale Model for Cast Materials in High Cycle Fatigue Regime : application to marine propellers

S. Calloch, A. Ezanno, C. Doudard (ENSTA Bretagne), J.-L. Heuzé (DGA), T. Millot (DCNS)

S2.3 - Microplasticity and energy dissipation in very high cycle fatigue

V. Favier, N.-L. Phung, N. Ranc, T. Bretheau, J. Gros-la-faige, G. Roger, W. Seiler, F. Vales (PIMM), D. Wagner, C. Wang, C. Bathias, J. Cedelle, I. Ranc (LEME), A. Chrysochoos, A. Blanche, B. Wattrisse, G. Camp, A. Clary, Y. El Kaim, F. Jourdan (LMGC), F. Grégori, B. Bacroix (LSPM), A. Galtier, G. Thoquenne (Cetim), H. Mughrabi (Erlangen University)

Workshop 1

Welded components and structures

W1.1 - Improvements in the fatigue assessment of large welded structures using the nominal stress approach

G. Elbel (Liebherr-France SAS, Colmar, France), M. Karge (Liebherr Mining Equipment Co., Newport-News)

W1.2 - Fatigue Analysis of a Welded Hub for a Mid Power Wind Turbine

P.Goes, F. Van den Abeele, H. Ahmed (OCAS N.V), X.Vanwijck, A. De Broe, (3E, Brussels)

W1.3 - Fatigue Design of Welded Components and Structures: An Overview of Work Done within the International Institute of Welding

G. Marquis (Aalto University)

W1.4 - Experimental and Numerical Investigation on the Fatigue Limit of Block Flanges used for Steel Penstocks in Hydro Power Plants

A. Lechner, R. Greiner (Institute for Steel Structures and Shell Structures, Graz University of Technology)

W1.5 - Investigation of technological size effects of welding on the residual stresses and fatigue life of tubular joints made of structural steels S355 and S690

F. Zamiri, C. Acevedo, A. Nussbaumer (EPFL, Lausanne), J. Krummenacker (Karlsruhe Institute of Technology - KIT),

W1.6 - Fatigue behaviour of tubular K-joints with thickwalled chords

U. Kuhlmann, M. Euler, M. Hubmann (Stuttgart University, Stuttgart), Ö. Bucak, A. Fischl (Munich University of Applied Sciences, Munich), I. Mangerig R. Wagner (Universität der Bundeswehr, Munich), B. Kranz, J. Herrmann, R. Zschech (Schweißtechnische Lehr- und Versuchsanstalt Halle)

W1.7 - High-strength steels: Low-cycle fatigue behavior of longitudinal stiffeners

J. Hrabowski, S. Herion, T. Ummenhofer (KIT Steel & Lightweight Structures, Karlsruhe)

W1.8 - Seam weld fatigue design for automotive chassis parts: recent numerical computation improvements

L. Armani, M.L. Fachhinetti (PSA Peugeot Citroën), M. Duchet, B. Weber (ArcelorMittal, Maizières-les-Metz)

W1.9 - New FEA shell element model for seam weld static and fatigue structural assessment

D. Turlier, P. Klein, L. De Noni (LOHR Industrie, Duppigheim), D. Lawrjaniec (Institut de Soudure, Yutz)

W1.10 - Fatigue of girth welds in reeled clad steel catenary risers

K. A. Macdonald, R Jones, D Karunakaran, J Mair (Subsea 7)

W1.11 - Fatigue assessment of welded bicycle frames

A. Callens (Decathlon, Mknix Engineering Center), A. Bignonnet (Consulting, Beaulieu)

Workshop 7
Fatigue crack propagation assessment

W7.1 - Stress intensity factors for planar cracks of arbitrary shapes

P. Lindroth (Aalto University), G. Glinka (University of Waterloo), G. Marquis (Aalto University)

W7.2 - Fatigue crack growth under vibration load

E. Wyart, H. Minnebo (Cenaero)

W7.3 - Some recent advances in remeshing techniques for complex 3D crack growth industrial applications

Vincent Chiaruttini (Onera)

W7.4 - Model prediction of fatigue crack propagation in base and corroded metal

D. Marhabi, A. Iost, M. Smati, M. Nasri, J.M. Nianga (Hautes Études d'Ingénieur)

W7.5 - Influence of weld-seams on fluid-structure-interactions in pipe flows

M. Kuschewski, D. Klören, R. Kulenovic, E. Laurien (University Stuttgart)

W7.6 - 3D experimental and numerical fatigue crack analysis

M-C Baietto, A. Combescure, A. Gravouil, J. Réthoré (INSA Lyon, LaMCoS), J-Y Buffière (INSA Lyon, MATEIS), S. Roux, F. Hild (LMT-Cachan ENS Cachan)

Workshop 8

Welded components and structures – Improvement techniques

W8.1 - Improvement of the welding joints and components by shot peening

I. Huther (Cetim), E. Daniel (Metal Improvement Company)

W8.2 - Taking into account of execution quality, steel grade and post-welding treatment in Eurocode 3 Part 1-9

M. Lukić (CTICM, Saint-Aubin)

W8.3 - Fatigue of Laser-Arc Hybrid Steel Welded Joints and Comparison with Conventional Arc Welding

P. Gressel, D. Lawrjaniec (Institut de Soudure, Yutz), S. Deckert, D. Turlier (Lohr Industrie, Duppigheim), K. Chouf (Air Liquide - CTAS, Saint-Ouen l'Aumône), A. Miclot (Caterpillar, Grenoble), R. Fabbro, E. Le Guen (CNRS/PIMM, Paris), A. Hazotte (CNRS/LEM3, Metz)

W8.4 - Fatigue behaviour of arc welded assemblies: paths of improvement

M. Duchet, M. Amblard, L. Cretteur, S. Michaut, J. Goudemez, B. Weber (ArcelorMittal), O. Brière, V. Desfontaine (Sonats)

Workshop 2

Thermal and thermomechanical fatigue damage

W2.2 - Thermo-mechanical fatigue characterisation of a new ferritic stainless steel for very high temperature exhaust parts

L. Faivre, P.-O. Santacreu, A. Acher (Aperam Stainless France, Isbergues)

W2.3 - Design of a fatigue rig for testing turbine blades under cyclic loading at ambient and elevated temperature

M. Leroy, A. Köster, D. Ryckelynck, L. Rémy (Centre de matériaux, Mines Paristech)

W2.4 - Improving of hot forging tool life hardfaced by Stellite-6

A. Fekih, H. Bonnefoy, A. Lodini (LACMDTI, Université de Reims), P. Revel (Laboratoire Roberval, UTC)

W2.5 - Thermomechanical fatigue test of cast iron GGG SiMo 4.05 and its numerical evaluation

C. Novotny, M. Spaniel, M. Dvorak (CTU in Prague, Faculty of Mechanical Engineering)

W2.6 - Lifetime of a welded structure subjected to thermal-mechanical loadings: application to exhaust manifolds

A. Benoit, F. Oger (PSA Peugeot Citroën), L. Remy, A. Koster (École des Mines Paristech), H. Maitournam (École Polytechnique Paristech)

W2.7 - Low cycle fatigue behavior of a type 304L austenitic stainless steel in various environmental and temperature conditions (air, vacuum at 20°C or 300°C)

L. de Baglion (Areva NP), J. Mendez (Institut P' (LMPM_Ensma), Poitiers), JA. Le Duff (Areva NP)

Workshop 3

Composites and elastomers fatigue behaviour improvement techniques

W3.1 - PROBADUR : Probabilistic Durability of Structural Laser Assemblies made of Continuous Fibre Thermoplastic Composite Materials

Ph. Castaing, C. Peyrac, P. Boutet (Cetim), J. Renard, M. Oumarou (ENSMD Paristech), C. Binetruy, M. Deléglise (ENSMD), W. Knapp (CLFA-Fraunhofer ILT), A. Giessl (Fraunhofer LBF)

W3.2 - Elastomers characterization in fatigue and crack propagation

L. Perier (01dB-Metravib, Limonest), F. Rouillard (LRCCP, Vitry)

W3.3 - Innovative methodology for fatigue cracking assessment of gas loaded accumulator's separator using accelerated endurance testing

K. Nesnas, A. Houssais (Olaer Industries), Régis Borek, P. Bonnet (I-comète)

W3.4 - Fatigue behaviour of laser welded thermoplastic composites

P. Boutet, C. Peyrac, A. Galtier (Cetim)

Workshop 9

Fatigue of orthopaedic implant materials

W9.1 - Development of fatigue strength Verification methods for Novel Hip Replacement Designs

A.S. Dickinson, M. Browne (University of Southampton), A.C. Taylor, A.C. Roques (Aurora Medical Ltd)

W9.2 - Fatigue performance of commercial bone cements

N. Shearwood-Porter, M. Browne, I. Sinclair (University of Southampton)

W9.3 - Reliability approach in implant fatigue design

Y. Suchier, M. Chollet, I. Huther (Cetim)

Workshop 4

Fatigue damage mechanisms

W4.4 - High-cycle Fatigue Modeling at Heat Treatment of Nickel Superalloy ChS70VI for Gas-turbine Blades

Y.- E.L. Sanchugov (FUN University Hanover), V. V.P. Valuev (LMZ-VTUZ at Leningrad)

W4.5 - Fatigue design of A356T6 under multiaxial loading

Y. Nadot (Institut P' - Université de Poitiers - Ensma), M. Roy, D.M. Maijer (The University of British Columbia), M. Iben Houria, R. Fathallah (LGM, École nationale d'Ingénieurs de Sousse)

W4.6 - Prediction of fatigue properties forged components: influence of the manufacturing process

M. Puget, C. Doudard, S. Calloch (Ensta Bretagne), F. Boucher (Stryker)

Workshop 10

Fatigue design methodologies

W10.1 - Evaluation of the highly stressed volume as design parameter for fatigue strength of notched aluminium specimens

B. Van Hooreweder, R. Boonen, D. Moens, P. Sas (K.U.Leuven)

W10.2 - Multiaxial Fatigue Limit Evaluation by Criteria Based on von Mises Stress

J. Papuga, M. Hronek, M. Vargas (Czech Technical University in Prague)

W10.3 - A computational fatigue approach to threaded connections

D. Bellett, F. Morel, H. Mejia (Lampa, Arts et métiers ParisTech, Centre d'Angers)

W10.4 - Designing adhesively-bonded joints for infinite lifetime when subjected to creep and (or) fatigue loadings

Jean-Pierre Jeandrau (Cetim, Saint-Étienne)

Workshop 4 **Fatigue damage mechanisms**

W4.1 - A probabilistic high cycle fatigue model applied to cast Al-Si alloys

I. Koutiri, D. Bellett, F. Morel (Lampa, Arts et métiers ParisTech, Centre d'Angers), L. Augustins (PSA Peugeot Citroën)

W4.2 - Development of a Two Scale incremental model for multiaxial fatigue in an industrial context

R. Desmorat (LMT, Cachan), A. du Tertre, (Snecma Space Engines Division), G. Barbier (LMT, Cachan)

W4.3 - Relationship between microstructure and fatigue damage of alternator fans

F. Léaux, J. Bouquerel, J.-B. Vogt (Umet Université de Lille), F. Palleschi (Valeo Systèmes Électriques)

Workshop 5 **Fatigue testing**

W5.1 - Accelerated fatigue test for automotive chassis parts design: an overview

P. Beaumont, M.L. Facchinetti, G. Martin Borret (PSA peugeot Citroën), F. Guerin (ISTIA - Université d'Angers), P. Lantieri (Arts et Metiers ParisTech)

W5.2 - Fast determination of the influence of a plastic pre-strain on the high cycle fatigue properties of steel sheets from self-heating measurements

R. Munier, C. Doudard, S. Calloch (LBMS, Ensta-Bretagne), B.Weber (ArcelorMittal Maizières Research & Development)

W5.3 - Fatigue Testing by Means of Miniature Test Specimens

Josef Volak , Matyas Novak, (Research and Testing Inst. Ltd., Pilsen), Jaroslav Kaiser, Vaclav Mentl (University of West Bohemia, Pilsen)

W5.4 - Methodology to account for corrosive environment on accelerated fatigue test on mooring chains within the Chain Out of Plane Bending (OPB) fatigue Joint Industry Project (JIP)

L. Rampi (SBM Offshore), P. Vargas (Chevron Energy Technology Co, Houston)

Workshop 6 **Mechanical behaviour in contact fatigue**

W6.1 - Gearbox gear fatigue

P.-E. Dumouchel (PSA Peugeot Citroën)

W6.2 - Computational and experimental investigation of fatigue life under fretting conditions

M. Španiel, J. Jurenka, J. Kuželka, M. Nesládek, J. Ružicka (Czech Technical University in Prague, Fac. of Mech. Eng.)

W6.3 - Influence of surface integrity by high precision hard turning on rolling contact fatigue

N. Jouini, P. Revel (Laboratoire Roberval- UTC), G. Thoquenne (Cetim), M. Bigerelle (Laboratoire Roberval-UTC)

W6.4 - Simulation of fatigue crack propagation under contact loading conditions

J. Jurenka, M. Španiel (Czech Technical University in Prague)

Workshop 11 **Vibration fatigue behaviour**

W11.1 - Modeling of plasticity in spectral methods for fatigue damage estimation of random vibrations

H. Rognon, T. Da Silva Botelho, I. Tawfiq (Lismma-Supméca), A. Galtier, M. Bennebach (Cetim)

W11.2 - Vibration fatigue analysis of a strut for airborne radar

R. Luo, J. Lindahl (Electronic Defence Systems, SAAB, Gothenburg)

W11.3 - Obtaining a Swept Sine on Random Vibration profile for powertrain mounted component qualification

B. Beaum (PSA Peugeot Citroën), F. Kihm, A. Halfpenny (HBM-nCode), J-M. Chambord (01dB Metravib)

W11.4 - Modelling Fatigue Spectrum of Aircraft Structure under Gust Loads

T. Reytier, C. Bes (Université Paul Sabatier), P. Marechal, M. Bianciardi, A. Santgerma (Airbus Opérations SAS)

W11.5 - UCAV's dynamic behavior under rough aero-acoustic loading

F. Vidal de Saint Jean, M. Pouzargue (Dassault Aviation)

W11.6 - Fatigue vibration process for a helicopter-mounted turret

L. Fouché-Sanseigne, P.-O. Bracq (Nexter Systems)

Workshop 12 **Reliability approaches in fatigue design**

W12.1 - Reliability assessment of an aerospace component subjected to fatigue loadings: APPRoFi project

B. Echard, N. Gayton, M. Lemaire (Ifma), M. Afzali (Cetim), A. Bignonnet (AB Consulting), P-A. Boucard (LMT-ENS Cachan), G. Defaux (Phimeca), J-L. Dulong (UTC), A. Ghouali (Snecma-Vernon), F. Lefebvre (Cetim), A. Pyre (Snecma-Vernon)

W12.2 - Reliability assessment of an aircraft engine assembly: APPRoFi project

P-A. Boucard, D. Néron, N. Relun (LMT-ENS Cachan), B. Echard, N. Gayton, M. Lemaire (Ifma), M. Afzali, F. Lefebvre (Cetim), A. Bignonnet (AB Consulting), G. Defaux (Phimeca), J-L. Dulong (UTC), A. Pyre, A. Ghouali, A. Otsmane, H. Cherouali (Snecma/Villaroche)

W12.3 - A new reliability approach for the fatigue design of railway wheels

X. Lorang, Thi Mac-lan Nguyen, C. Roux (SNCF, Direction de l'Innovation et de la Recherche), A. Ouradi (MATIS Technology)

W12.4 - Mechanical reliability approach for heterogeneous welding design in vibratory environment

A. Boucly, T. Grunenwald (CEA DAM centre de Valduc), R. Borek, P. Bonnet (Société I-Comète)

POSTERS

Multiparametric strategy dedicated to probability of failure calculation

N. Relun (LMT / ENS Cachan)

High cycle fatigue reliability approach based on Kakuno and Kawada criterion with an application for design an Equal-Leaves Spring

A. Doukh (Ipeim), R. Ben Sghaier (Issats)

PROBADUR : Probabilistic Durability of Structural Laser Assemblies made of Continuous Fibre Thermoplastic Composite Materials

Ph. Castaing, C. Peyrac, P. Boutet (Cetim), J. Renard, M. Oumarou (ENSMD Paristech), C. Binetruy, M. Deléglise (ENSMD), W. Knapp (CLFA-Fraunhofer ILT), A. Giesl (Fraunhofer LBF)

On multi-instrumentation technics for damage identification of 3D composite materials

J. Henry (Laboratoire de Roberval - Snecma Villaroche), Z. Aboura, K. Khellil (Laboratoire de Roberval), S. Otin, L. Olivier (Snecma Villaroche)

Multi-scale modeling of fatigue damage of continuous fiber reinforced polymer composites

D. Vasiukov, S. Panier, A. Hachemi (Composite materials, Fatigue damage, Multi-scale analysis, Life prediction)

MXFAT - Logiciel de fatigue innovant critère de Dang Van, fatigue modale, fatigue spectrale

K. Dang Van (Mecamix Xtech), B. Gallali (Imeca)

Effects of single overload/underload on fatigue life of 350WT steel using FE-simulation of PICC

M. H.Gozin, M. Aghaie-Khafri (University of Technology Tehran)

Influence of casting defects on the fatigue behaviour of an AlSi7Mg0,6-T6 aerospace alloy

I. Serrano-Muñoz, C. Verdu, J. Y. Buffière (Insa-Lyon)

Contact fatigue & wear of roller mills. Influence of hardfacing microstructure and residual stresses

M. Duquenne, A. Mouftiez, S. Hariri (École des Mines de Douai), E. Romero, S. Devroe (Fives FCB, Research Center)

Numerical simulation of deep drawn components body of a vehicles subject to fatigue

O. Boussaid,(Université de Annaba), M. Rabahallah (Université de Metz)

Stress-Based Analyses of Random Multiaxial Loading on a Specimen with a Hole

J. Papuga (Czech Technical University)

Software evolution to support advanced mechanical testing methods: an example about Thermo-Mechanical Fatigue Testing

M. Fajfrowski, C. Leser (MTS Systems Corporation)

Fatigue design of welded joints treated by high frequency hammer peening

G. Le Quilliec (Cetim ; Iffstar, Nantes ; Lismma-Supméca), M. Drissi-Habti (Iffstar, Nantes), G. Inglebert,(Lismma-Supméca), H-P. Lieurade, P. Macquet, L. Jubin (Cetim)

Crack propagation law identification by Digital Image Correlation

P. Boutet (Cetim, LMT-Cachan), F. Lefebvre (Cetim), F. Hild (LMT-Cachan)

Modeling of plasticity in spectral methods for fatigue damage estimation of random vibrations

H. Rognon, T. Da Silva Botelho, I. Tawfiq (Lismma-Supméca), A. Galtier, M. Bennebach (Cetim)