ECCOMAS Thematic Conference
Mechanical Response of Composites

2007

Conference Programme

12th-14th September, 2007
Faculdade de Engenharia da Universidade do Porto

Sponsored by:
ECCOMAS – COMPOSITES 2007

The European Community on Computational Methods in Applied Sciences Thematic Conference on Mechanical Response of Composites – ECCOMAS - Composites 2007 – aims at discussing the most recent progresses and breakthroughs in the area of analytical and numerical modelling of the mechanical response of advanced composite materials.

The conference venue is the Faculty of Engineering, University of Porto, Portugal, and the conference is supported by INEGI, ECCOMAS, Associação Portuguesa de Mecânica Teórica, Aplicada e Computacional, French Society for Composites and Fundação para a Ciência e Tecnologia, to whom we are grateful.

A book entitled 'Mechanical Response of Composites' with the papers from the three invited speakers and with a selection of the twelve papers presented in the conference will be published by Springer in the ECCOMAS book series.

We hope that this conference is of your interest and we hope you leave Porto with valuable new information, experience and knowledge relevant to your research.

The Organising Committee
CONFERENCE CHAIRMEN

Pedro P. Camanho  
Department of Mechanical Engineering, University of Porto, Portugal

Carlos G. Dávila  
NASA Langley Research Center, United States of America

Silvestre T. Pinho  
Department of Aeronautics, Imperial Collage London, United Kingdom

Joris Remmers  
Department of Aerospace Engineering, Delft University of Technology, The Netherlands

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C. Schuecker, Vienna University of Technology, Austria  
R. de Borst, Delft University of Technology, The Netherlands  
S. Lomov, Katholieke Universiteit Leuven, Belgium  
R. Rolfes, University of Hannover, Germany  
A. Johnson, DLR Stuttgart, Germany  
A. Corigliano, Politecnico de Milano, Italy  
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INVITED LECTURES

René de Borst, Eindhoven University of Technology, The Netherlands  
Brian Cox, Teledyne Scientific Co., United States of America  
Raimund Rolfes, Leibniz University of Hannover, Germany
ECCOMAS THEMATIC CONFERENCE
MECHANICAL RESPONSE OF COMPOSITES

12, 13 and 14 September 2007
Faculdade de Engenharia da Universidade do Porto, Portugal

SESSION PROGRAMME

TUESDAY, 11TH SEPTEMBER

The afternoon is reserved for registration procedures.

WEDNESDAY, 12TH SEPTEMBER

08.00 – 08.45  Registration
08.45 – 09.00  Conference Opening and Welcome to Porto
09.00 – 10.25  Session 1 – FRACTURE MECHANICS I
   Chair: Dr. Carlos Dávila, NASA Langley Research Center,
   United States of America
10.25 – 10.55  Coffee Break
   Poster Session 1 – DYNAMICS AND FATIGUE
   Poster Session 2 – NANOCOMPOSITES
10.55 – 12.35  Session 2 – MICROMECHANICS
   Chair: Prof. Erik Lund, Department of Mechanical Engineering,
   Aalborg University, Aalborg, Denmark
12.35 – 14.00  LUNCH
14.00 – 16.15  Session 3 – WOVEN AND NON-CRIMP FABRICS I
   Chair: Dr. Afzal Suleman, University of Victoria, Canada
16.15 – 16.45  Coffee Break
16.45 – 18.35  Session 4 – OPTIMIZATION AND STRUCTURAL HEALTH
   MONITORING
   Chair: Dr. Paola Caracciolo, AIRBUS Deutschland GmbH,
   Hamburg, Germany
19.00  Reception at Círculo Universitário
THURSDAY, 13TH APRIL

09.00 – 10.25  **Session 5 – PROGRESSIVE DAMAGE ANALYSIS**
Chair: Dr. Clara Schuecker, NASA Langley Research Center, United States of America

10.25 – 10.55  **Coffee Break**
Poster Session 3 – MICROMECHANICS AND MULTI-SCALE MODELLING
Poster Session 4 – OPTIMIZATION AND STRESS ANALYSIS

10.55 – 12.35  **Session 6 – MECHANICAL BEHAVIOUR OF COMPOSITES**
Chair: Dr. Stephen Hallett, University of Bristol, United Kingdom

12.35 – 14.00  **LUNCH**

14.00 – 16.15  **Session 7 – FATIGUE**
Chair: Dr. Silvestre Pinho, Imperial College London, United Kingdom

16.15 – 16.45  **Coffee Break**

16.45 – 18.35  **Session 8 – IMPACT**
Chair: Prof. Carlos Mota Soares, Instituto Superior Técnico, Lisboa, Portugal

19.30  Conference Dinner at the Cellars of Port Wine in Vila Nova de Gaia

FRIDAY, 14TH APRIL

09.00 – 10.25  **Session 9 – WOVEN AND NON-CRIMP FABRICS II**
Chair: Prof. Tong Earn Tay, National University of Singapore, Singapore

10.25 – 10.55  **Coffee Break**
Poster Session 5 – NEW MATERIALS
Poster Session 6 – SIMULATION OF INDUSTRIAL PROCESSES

10.55 – 12.35  **Session 10 – MULTI-SCALE MODELLING**
Chair: Prof. Josep Costa, Universidad de Girona, Spain

12.35 – 14.00  **LUNCH**

14.00 – 16.15  **Session 11 – FRACTURE MECHANICS II**
Chair: Prof. António Torres Marques, Faculdade de Engenharia, Universidade do Porto, Portugal

16.15 – 16.45  **Coffee Break**

16.45 – 18.35  **Session 12 – CONTINUUM DAMAGE MECHANICS**
Chair: Prof. Stepan Lomov, Katholieke Universiteit Leuven, Belgique

18.40  Conference Closes
ECCOMAS THEMATIC CONFERENCE  
MECHANICAL RESPONSE OF COMPOSITES  

12, 13 and 14 September 2007  
Faculdade de Engenharia da Universidade do Porto, Portugal

FULL PROGRAMME

TUESDAY, 11TH SEPTEMBER

The afternoon is reserved for registration procedures.

WEDNESDAY, 12TH APRIL

08.00 – 08.45 Registration
08.45 – 09.00 Conference Opening and Welcome to Porto

SESSION 1  FRACTURE MECHANICS I
Chair: Dr. Carlos Dâvila, NASA Langley Research Center, United States of America

09.00 – 09.35 René de Borst, Eindhoven University of Technology, The Netherlands  
Computation of delamination and cracking in composites based on the partition-of-unity concept

Development of a Finite Element Methodology for the Collapse Analysis of Composite Aerospace Structures

10.00 – 10.25 Kingshuk Bose, R. Ajay Mahakali, Department of Mechanical Engineering and Engineering Science, University of North Carolina at Charlotte, Charlotte, USA  
Investigations into the Optimum Choices of Cohesive-Zone Parameters Describing the Initiation and Propagation of Cracks
10.25 – 10.55  COFFEE BREAK

POSTER SESSION 1 – DYNAMICS AND FATIGUE

Masoud Tahani, Taha Talebian, Department of Mechanical Engineering, Faculty of Engineering, Ferdowsi University of Mashhad, Mashhad, Iran
Studies on Dynamic Behavior of Functionally Graded Hollow Cylinders

Erfan Moshkani Farahani, Masoud Moshkani Farahani, Faculty of Engineering, Bu-Ali Sina University of Hamedan, Hamedan / Faculty of Engineering, Azad university of Arak, Arak, Iran
Exact and Approximate Free Vibration Analysis of Laminated Beam using DQM

Tamer Sinmazçelik, Onur Çoban, Mustafa Özgür Bora, Volkan Güney, Ismail Cürgür, Kocaeli University, Mechanical Engineering Department, Izmit and TUBITAK-MRC, Material Institute, Gebze, Turkey
The Effects of Thermal Cycles on the Fatigue Impact Properties of Thermoplastic Matrix Composites

Raman Bedi, Rakesh Chandra, Department of Mechanical Engineering, National Institute of Technology, Jalandhar, India
Fatigue Life Determination of Pultruded Glass Fiber Reinforced Composites

POSTER SESSION 2 – NANO COMPOSITES

Victor N. Gulbin, Valery G. Kulichikhin, Vladimir A. Popov, R & D Institute of Construction Technology / Russian Academy of Sciences / Moscow Institute of Steel & Alloys (Technology University), Russia
Investigation Composite Materials with High Hardness Nanopowders

Paulo S. Lima, José M. Oliveira, Vitor A. F. Costa, High School North -Aveiro / CICECO / Mechanical Engineering Department, University of Aveiro, Portugal
Mechanical Behaviour of Surface Modified Glass Bead/epoxy Composites

Vladimir A. Popov, Sergey A. Tulupov, Konstantin V. Latynin, Marina N. Kovalchuk, Moscow Institute of Steel and Alloys / MEPhI / IMT, Chernogolovka, Moscow, Russia
Improvement of Metal Coatings with Nanoreinforcements

SESSION 2  MICROMECHANICS
Chair: Prof. Erik Lund, Department of Mechanical Engineering, Aalborg University, Aalborg, Denmark

10.55 – 11.20  Anders Libak Hansen, Erik Lund, Bent F. Sørensen, Department of Mechanical Engineering, Aalborg University, Denmark / Risø National Laboratory, Technical University of Denmark, Denmark
Simulation of Delamination including Fiber Bridging using Cohesive Zone Models

11.20 – 11.45  Essam Totry, Carlos González, Javier Llorca, Universidad Politécnica de Madrid, Spain / IMDEA Materiales, Madrid, Spain
Validation of Failure Criteria for Composite Materials under Transverse Compression and Shear using Computational Micromechanics
11.45 – 12.10 Elena Correa Montoto, Vladislav Mantic, Federico Paris, School of Engineering, University of Sevilla, Spain
Effect of Curing Stresses on the Inter-Fibre Failure under Transverse Tension

12.10 – 12.35 Betiana A. Acha, Leif Carlsson, Richard D. Granata, Department of Ocean Engineering / Department of Mechanical Engineering, Florida Atlantic University, Boca Raton, Florida, USA
Investigation of Moisture Effects on Interfacial Properties of Carbon Fibre Composites by Dynamic Mechanical Analysis

12.35 – 14.00 LUNCH

SESSION 3 WOVEN AND NON-CRIMP FABRICS I
Chair: Dr. Afzal Suleman, University of Victoria, Canada

14.00 – 14.35 EXTENDED LECTURE 1
Wen-guang Jiang, Stephen R. Hallett, Department of Aerospace Engineering, University of Bristol, UK
Development of a Domain Superposition Technique for the Modelling of Woven Fabric Composites

14.35 – 15.00 Joan Andreu Mayugo, Ever J. Barbero, Dani Trias, AMADE, University of Girona, Spain / Mechanical and Aerospace Engineering, West Virginia University, Morgantown, USA
Meso-mechanical Finite Element Modeling of Fabric Reinforced Composites

15.00 – 15.25 Mathieu Colin de Verdiere, Alex A. Skordos, Anthony K. Pickett, Composites Centre, Materials Department, School of Applied Sciences, Cranfield University, UK / Institut für Flugzeugbau, Universität Stuttgart, Germany
Effect of Tufting on the Response of Non Crimped Fabric Composites

15.25 – 15.50 Daniel Hartung, Lars Aschenbrenner, Jan Tessmer, German Aerospace Center (DLR), Institute of Composite Structures and Adaptiv Systems, Structural Mechanics, Braunschweig, Germany
Analysis of the Through-Thickness Material and Failure Behaviour of Textile Composites

15.50 – 16.15 Katleen Vallons, Stepan V. Lomov, Ignaas Verpoest, Department of Metallurgy and Materials Engineering, Katholieke Universiteit Leuven, Leuven, Belgium
Damage Evolution in Static and Fatigue Tensile Loading of Carbon/epoxy NCF Composites

16.15 – 16.45 COFFEE BREAK
SESSION 4  OPTIMIZATION AND STRUCTURAL HEALTH MONITORING
Chair: Dr. Paola Caracciolo, AIRBUS Deutschland GmbH, Hamburg, Germany

16.45 – 17.20  EXTENDED LECTURE 2
Erik Lund, Leon S. Johansen, Department of Mechanical Engineering, Aalborg University, Aalborg, Denmark
On Buckling Topology Optimization of a Wind Turbine Blade

17.20 – 17.45  Casey Keulen, Mehmet Yildiz, Afzal Suleman, University of Victoria, Department of Mechanical Engineering, Victoria, Canada / IDMEC-IST, Lisbon, Portugal
Manufacturing Process and Health Monitoring of Composite Structures Using FBG Sensors

17.45 – 18.10  Reza Ahmadian, Angela Vincenti, Paolo Vannucci, Université Paris 6 "Pierre et Marie Curie" (UPMC), Paris / Université de Versailles et St. Quentin en Yvelines (UVSQ), Versailles, France
A General Approach to Optimal Design of Composite Laminates with Respect to Limit States

18.10 – 18.35  Laura Ferrero, Ugo Icardi, Politecnico di Torino, Torino, Italy
Assessment and Optimization of Multiple Core Sandwich Composites

18.30  Reception at Círculo Universitário
THURSDAY, 13TH APRIL

SESSION 5  PROGRESSIVE DAMAGE ANALYSIS
Chair: Dr. Clara Schuecker, NASA Langley Research Center,
United States of America

09.00 – 09.35 INVITED LECTURE 2
Brian Cox, Teledyne Scientific Co., USA
Combining Top-Down, Bottom-Up, and Experimental Methods
to Formulate High-Fidelity Damage Simulations in Composites

09.35 – 10.00 Tong-Earn Tay, Feng Shen, V.B.C. Tan, Department of
Mechanical Engineering, National University of Singapore
Recent Progress in Progressive Damage Analysis of
Composite Structures

10.00 – 10.25 Adrian F. Gill, Paul Robinson, Silvestre T. Pinho, Department
of Aeronautics, Imperial College London, London, United
Kingdom
Measurement of Damage Progression in Open Hole Tension Tests

10.25 – 10.55 COFFEE BREAK

POSTER SESSION 3 – MICROMECHANICS AND MULTI-SCALE
MODELLING

Ernest T.Y. Ng, Afzal Suleman, University of Victoria, Victoria, British Columbia, Canada /
Instituto Superior Tcnico, Lisbon, Portugal
Elastoplastic Modeling of Multi-phase Metal Matrix Composite with Void Growth using the
Transformation Field Analysis and Governing Parameter Method

Ziad Youssef, Frederic Jacquemin, David Gloaguen, Ronald Guillén, Université de Nantes -
École Centrale de Nantes, Nantes, France
A Self Consistent Approach for Hygroscopic Internal Stresses Prediction in Viscoelastic
Composite Materials

António Rui Melro, Pedro P. Camanho, Silvestre T. Pinho, DEMEGI, Faculdade de Engenharia,
Universidade do Porto, Porto, Portugal / Imperial College London, UK
Micromechanical Study of Fibre Reinforced Composites with Transversal Randomness

POSTER SESSION 4 – OPTIMIZATION AND STRESS
ANALYSIS

Jadran Šundrica, Tomislav Filetin, Martin Lazar, Mechanical Engineering Department, Univ. of
Dubrovnik / Faculty of Mechanical Engineering and Naval Architecture and Department of
Mathematics Univ. of Zagreb, Croatia
Models of Calculating the Properties of Laminates and Spatially Reinforced Composites
SESSION 6  MECHANICAL BEHAVIOUR OF COMPOSITES
Chair: Dr. Stephen Hallett, University of Bristol, United Kingdom

10.55 – 11.20 Pablo Mata, Sergio Oller, Alex Barbat, Rubén Boroschek,
Technical University of Catalonia, Barcelona, Spain / University of Chile, Santiago, Chile
*Nonlinear Constitutive Formulation for a Finite Deformation Beam Model based on the Mixing Rule for Composites*

11.20 – 11.45 Xavier Martinez, Sergio Oller, Ever J. Barbero, International Centre for Numerical Methods in Engineering, Barcelona, Spain / Mechanical and Aerospace Engineering, West Virginia University, USA
*Study of Delamination in Composites by Using the Serial/Parallel Mixing Theory and a Damage Formulation*

11.45 – 12.10 António J. M. Ferreira, Carla M. C. Roque, Renato M. N. Jorge,
Departamento de Engenharia Mecânica e Gestão Industrial, Faculdade de Engenharia da Universidade do Porto, Porto, Portugal
*Analysis of Laminated Composite Shells by a Higher-order Formulation and a Collocation Meshless Method using Radial Basis Functions*

12.10 – 12.35 Houssem Miled, Luisa Silva, Thierry Coupez, Ecole des Mines de Paris, Centre de Mise en Forme des Matériaux, France
*Numerical Simulation of Fiber Orientation and Resulting Thermo-elastic Behavior in reinforced Thermo-plastics*

12.35 – 14.00 LUNCH

SESSION 7  FATIGUE
Chair: Dr. Silvestre Pinho, Imperial College London, United Kingdom

14.00 – 14.35 EXTENDED LECTURE 3
Albert Turon, Josep Costa, Pedro P. Camanho, Pere Maimí,
AMADE, University of Girona, Spain / DEMEGI, Universidade do Porto, Portugal
*Simulation of Delamination Onset and Propagation under Fatigue Loading using Cohesive Zone Models*

14.35 – 15.00 Paul W. Harper, Stephen R. Hallett, Department of Aerospace Engineering, University of Bristol, Bristol, United Kingdom
*A Robust Interface Element Law for Delamination Propagation under Fatigue Loading*

15.00 – 15.25 Vaggelis. A. Passipoularidis, Theodore. P. Philippidis,
Department of Mechanical Engineering and Aeronautics, University of Patras, Greece
*A Life Prediction Methodology for Composites based on Progressive Damage Mechanics*
15.25 – 15.50 Rui Miranda Guedes, Departamento de Engenharia Mecânica e Gestão Industrial, Faculdade de Engenharia da Universidade do Porto, Portugal
*Creep and Fatigue Lifetime Prediction of Polymer Matrix Composites based on Simple Cumulative Damage Laws*

15.50 – 16.15 Maik Gude, Werner Hufenbach, Ilja Koch, Richard Protz, Jörg Jaschinski, Institute of Lightweight Structures and Polymer Technology – (ILK), TU Dresden, Dresden, Germany
*Fatigue and Cyclic Damage Progress of Novel 3D-Textile Reinforced Composites*

16.15 – 16.45 **COFFEE BREAK**

**SESSION 8**
**IMPACT**
Chair: Prof. Carlos Mota Soares, Instituto Superior Técnico, Lisboa, Portugal

16.45 – 17.20 **EXTENDED LECTURE 4**
Nathalie Toso-Pentecôte, Alastair F. Johnson, Zohreh Ebrahimi, German Aerospace Center, DLR Institute of Structures and Design, Stuttgart, Germany
*Modelling Impact Damage in Stiffened Composite Panels*

17.20 – 17.45 Lucio Raimondo, Lorenzo Iannucci, Paul Robinson, Silvestre T. Pinho, Department of Aeronautics, Imperial College London, London, United Kingdom
*A Numerical Material Model for Predicting the High Velocity Impact Behaviour of Polymer Composites*

17.45 – 18.10 Garth Pearce, Rodney Thomson, Don W. Kelly, Alastair Johnson, The University of New South Wales, Sydney, Australia / CRC-ACS, Melbourne, Australia / DLR - Institut für Bauweisen und Konstruktionsforschung, Stuttgart, Germany
*High Strain-Rate Response of Fastened Carbon Fibre Composite Joints in Composite Structures*

19.00 **Conference Dinner at the Cellars of Port Wine**
FRIDAY, 14TH APRIL

SESSION 9  WOVEN AND NON-CRIMP FABRICS II
Chair: Prof. Tong Earn Tay, National University of Singapore, Singapore

09.00 – 09.35 INVITED LECTURE 3
Raimund Rolfes, Leibniz University of Hannover, Germany
*Material and failure models for textile composites*

09.35 – 10.00 Masaru Zako, Tetsusei Kurashiki, Hiroaki Nakai, Makoto Imura, Department of Management of Industry and Technology, Osaka University
*A Multi-scale Analysis for Textile Composite Materials to Evaluate the Mechanical Behaviors*

10.00 – 10.25 Markus Kästner, Georg Haasemann, Volker Ulbricht, Technische Universität Dresden, Dresden, Germany
*Computation of Effective Stiffness Properties for Textile-Reinforced Composites Using X-FEM*

10.25 – 10.55 COFFEE BREAK

POSTER SESSION 5 – NEW MATERIALS

Cristiano Alves da Silva, Ivan de D. Valarelli, Paulo M. C. Ferrão, Manuel de Freitas, Instituto Superior Técnico, Lisboa, Portugal / Universidade Estadual Paulista, Bauru, Brasil
*Vegetable Fibers: A Possibility for Industrial Design of Products*

Masoud Tahani, Mojtaba Izadi Najafabadi, Department of Mechanical Engineering, Faculty of Engineering, Ferdowsi University of Mashhad, Mashhad, Iran
*Analytical Determination of Free Edge Stresses in Composite Laminates with Piezoelectric Layers*

*Grain Dispersion, Mechanical Behaviour and Fracture of PZT-PVDF Composites*

Nikolai I. Polushin, Victor N. Gulbin, Moscow Institute of Steel & Alloys / R&D Institute of Construction Technology, Moscow, Russia
*Development and Investigation of Diamond Composite Polycrystals*

POSTER SESSION 6 – SIMULATION OF INDUSTRIAL PROCESSES

Wang Wenjing, Li Qiang, Janice Barton, Beijing Jiaotong University, Beijing, China / University of Southampton, Southampton
*Experimental Study of High Temperature Mechanical and Fatigue Behaviours of SiCp_A356 Composites for Brake Disc*

Luis M. P. Durão, Marcelo F. S. F. de Moura, António T. Marques, Instituto Superior de Engenharia do Porto / Faculdade de Engenharia da Universidade do Porto, Portugal
*Drilling Process Simulation on Composite Laminates*
Drilling of Carbon Fiber Reinforced Polymer Composites by ND:YAG Laser

SESSION 10  MULTI-SCALE MODELLING
Chair: Prof. Josep Costa, Universidad de Girona, Spain

10.55 – 11.20  Vassili V. Toropov, Gennadiy V. Turotsev, University of Leeds, School of Civil Engineering, Leeds, UK / Zaporozhye Institute of Economics & Information Technologies, Ukraine
The Effective Elastic Properties of Periodic Composites with Imperfect Interface

11.20 – 11.45  Ziad Youssef, Frederic Jacquemin, David Gloaguen, Ronald Guillén, Université de Nantes - École Centrale de Nantes, Nantes, France
A Self-consistent Approach for Hygro-elastic Internal Stresses Prediction in Porous Composite Materials

11.45 – 12.10  João A. Oliveira, Joaquim Pinho-da-Cruz, Filipe Teixeira-Dias, Departamento de Engenharia Mecânica, Universidade de Aveiro, Aveiro, Portugal
On the Prediction of the Mechanical Properties of Composite Materials Using Asymptotic Expansion Homogenisation

12.10 – 12.35  Emmanuel Baranger, Christophe Cluzel, Pierre Lađevêze, Anne Mouret, LMT-Cachan/CNRS UMR8535/Université Paris, France / Snecma Propulsion Solide, Le Haillan Cedex, France
Prediction of the Lifetime of Self-healing Ceramic Matrix Composites

12.35 – 14.00  LUNCH

SESSION 11  FRACTURE MECHANICS II
Chair: Prof. António Torres Marques, Faculdade de Engenharia, Universidade do Porto, Portugal

14.00 – 14.35  EXTENDED LECTURE 5
Lars Chr. Terndrup Overgaard, Erik Lund, Department of Mechanical Engineering, Aalborg University, Denmark
Damage Analysis of a Wind Turbine Blade

14.35 – 15.00  Rosa Marat-Mendes, Manuel Freitas, Instituto Politécnico de Setúbal, Setúbal, Portugal / Instituto Superior Técnico, Lisboa, Portugal
Mode III Fracture Behaviour of Laminated Composite with ECT

15.00 – 15.25  Paola Caracciolo, Guido Kuhlmann, Airbus, Hamburg, Germany
Probabilistic Stress Analysis of Anisotropic Curved Beams

15.25 – 15.50  Nuno F. Rilo, Luis M. S. Ferreira, Rogério A. C. P. Leal, CEMUC Centro de Engenharia Mecânica da Universidade de Coimbra, Portugal
Low-Velocity Impact Damage on Glass-Epoxy Composite Laminated Plates
15.50 – 16.15 Gerald Wimmer, Heinz E. Pettermann, Institut of Lightweight Design and Structural Biomechanics, Vienna University of Technology, Vienna, Austria
Simulation of Delamination in Laminated Composite Components – a Fracture Mechanics Based Method

16.15 – 16.45 COFFEE BREAK

SESSION 12 CONTINUUM DAMAGE MECHANICS
Chair: Prof. Stepan Lomov, Katholieke Universiteit Leuven, Belgique

16.45 – 17.20 EXTENDED LECTURE 6
Clara Schuecker, Heinz E. Pettermann, Austrian Aeronautics Research (AAR) / Institute of Lightweight Design and Structural Biomechanics, Vienna, Austria
Combining Progressive Damage with Plasticity to Model the Non-linear Behavior of Fiber Reinforced Laminates

17.20 – 17.45 Frans P. van der Meer, L.J. Sluys, Delft University of Technology, Delft, The Netherlands
Interaction Between Intraply and Interply Failure in Laminates

17.45 – 18.10 Antoine Schenker, Alain Vinet, Stéphane Guinard, Laurent Risse, EADS Innovation Works, Toulouse / AIRBUS France, Toulouse, France
Experimental Study and Analysis of Large Damage in Composite Fuselage

18.10 – 18.35 Navid Zobeiry, Alireza Forghani, Reza Vaziri, Anoush Poursartip, Composites Group, Depts. of Civil Engineering and Materials Engineering, The University of British Columbia, Vancouver, BC, Canada
Progressive Damage Modelling of Composite Materials under both Tensile and Compressive Loadings

18.40 Conference Closes