NAFEMS

THE INTERNATIONAL ENGINEERING MODELIING, ANALYSIS AND SIMULATION COMMUNITY

Invitation & Agenda

European Conference

Coupled MBS-FE Applications: A New Trend in Simulation

26 - 27 November 2013, Frankfurt, Germany

For many years, engineers have recognised the need to simulate not only components submitted to different boundary conditions, but more complex systems where different components interact with each other mechanically.

Multi Body Simulation (MBS) was developed to satisfy this need, but with the goal of simulating the kinematics of multi body systems. At the same time, the classical Finite Element method was gaining further capabilities in the simulation of complex mechanical behaviours including non-linearities, both geometrical and material.

Today, those two technologies have been evolving together: MBS has gained more capabilities to introduce flexibility and even some non-linear effects in the "kinematic" description of a mechanism, whilst FE has developed the ability to take into account contact and kinematic joints. More recently, the coupling of these two methods through co-simulation has given provided solutions to another range of problems, taking advantage of both disciplines.

This conference, organized by the NAFEMS Computational Structural Mechanics and Multi Body Dynamics Working Groups, will bring together industry, academia and software vendors in order to give the attendees a clear picture of the real capabilities of these disciplines: MBS, FE, and the co-simulation of both, through the presentation of different applications.

We are looking forward to meeting you in Frankfurt.

For more information and online registration please see:

www.nafems.org/mbs2013

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Tuesday, 26th November 2013

09:00 Registration and exhibition opening

Session 1 - Welcome / Keynotes

09:45 **Welcome and NAFEMS Introduction**
T. Morris (NAFEMS)

09:55 **Overview and Introduction of NAFEMS MBS and CSM Working Group**
G. Baldesi (ESA/ESTEC, NED, chairman of MBS WG), P. Morelle (LMS, BEL, chairman of SCM WG)

10:15 **Keynote Pesentation:**
Coupled MBS-FE Applications: A New Trend in Simulation
M. Géradin (University Liege, BEL)

10:45 Coffee break

Session 2 – Automotive

11:20 **Brake Noise Simulation using Multibody Simulation Analysis**
B. Leblanc (Altair Engineering GER)

11:45 **Advanced Reduced Order Modeling of Joint Structures**
M. Breitfuss (Engineering Center Steyr, AUT)

12:10 **A Method for Fully-Coupled Simulation of Nonlinear Flexible Multi-body Systems**
W. Shen, S. Riley, M. Collingridge, H. Patel (MSC Software, USA)

12:35 **Developement of a Torsional Vibration Damper using Multibody Simulation**
S. Moon (Hyundai Motor Company, KOR)

13:00 Lunch Break

Session 3 – Aerospace

13:00 **Non-linear Flexible-Body Contact Analysis in a coupled MBD and FEA Simulation**
T. Kelichhaus (FunctionBay, GER)

14:25 **MBS-FE Use in Salor Array Deployement**
A. Giovannini (Thales Alenia Space, FRA)

14:50 **Coupled FE-Multi Body Simulation Of Flight Controls Functioning & Future Applications**
M. Vetter (Airbus, GER)

15:15 **Multibody Simulation in Aerospace : Technology Roadmap Discussion**
G. Baldesi (ESA/ESTEC, NED)

15:40 Coffee break

Session 4 – Miscellaneous Applications and Methods

16:20 **Co-Simulation Approach of a Sliding Door Slam Test**
A. Paraschoudis, S. Patil (Beta CAE Systems, GRE); G. Venkates, S. Doppalapudi (Chrysler Group, USA)

16:45 **Discrete and Finite Element Co-Simulations**
C. Bierwisch (Fraunhofer IWM, GER);C. Dehning (Fraunhofer SCAI, GER)

17:10 **An Eficient 3D FEM-DEM Coupling for Granular Matter Applications**
M. Michael, B. Peters (University Luxembourg, LUX); F. Vogel (inuTech, GER)

17:35 Coffee break

Session 5 – Miscellaneous Applications and Methods

18:00 **Industrial Validation of Novel Model Reduction Techniques to Represent Component Flexibility in Multibody Models**
G. Heriman (LMS, BEL); P. Holzwarth, M. Fischer, A.Toso, P. Eberhard (University Stuttgart, GER)

18:25 **FEM Formulations for Surgery Simulators**
D. Marinković, M. Zehn (TU Berlin, GER)

18:50 **Accurate Representation of Preloaded Flexible Components in Multi-body System through the Use of Craig-Bampton Modes**
S. Singh Sandhu, D. Wallerstein, H. Patel (MSC Software, USA)

19:15 **Beverages, snacks and entertainment in the exhibition area**
- time for discussions and product demonstrations

20:30 End of day 1

Hardware and software exhibition

Wednesday, 27th November 2013

08:00 Exhibition opening

Session 6 – Automotive

08:00 **Fatigue Analysis of Carbody for a Hybrid Simulation Model using Standard-Explicit Co-Simulation**
M. Kim (Hyundai Motor, KOR)

08:25 **Optimization of Suspension Component Design**
J. Engstrom (Red Cedar Technology, USA)

08:50 **A Simulation Toolchain Combining Multibody, Finite Element and Computational Fluid Dynamic Analyses**
R. Lancashire, M. Tijssens (TASS, NED)

09:15 **Vehicle Dynamics Simulation with FEA and MBD Co-Simulation**
A. Franck (Dassault Systèmes, GER)

09:40 Coffee break

Session 7 – Aerospace

10:20 **A Coupled Aero- and Structural Dynamics Model for Computation of Performance and Unsteady Loads on the Helicopter Skeldar V200**
P. Persson (Saab Aeronautics, SWE)

10:45 **An integrated Multi-Body/FEM Approach for Space Applications**
P. Gasbarri, G. Palmerini, M. Sabatini, A. Pisculli (University Rome, ITA)

11:10 **FE Based Simulation of Variable Stator Vanes Mechanisms**
P. Morelle (LMS, BEL)

11:35 **The Absolute Nodal Coordinate Formulation For Finite Elements (ANCF)**
T. Kush, A. Mohamed, J. Liu (Altair Engineering, USA)

12:00 **Challenge of Modelling a Multi-Stage Launch Vehicle**
T. Dejean , G. Baldesi (ESA/ESTEC, NED)

12:25 Lunch

Session 8 – Automotive

13:30 **A New Solution for Coupled Simulation of Multibody Systems and Nonlinear Finite Element Models**
G. Conti, T. Mertens, T. Sinokrot (LMS, ITA); H. Akamatsu, H. Kyogoku, K. Hattori (Nissan Motor, JPN)

13:55 **Coupled Analysis of Engine Mounts**
M. Bernard, K. Wolf (Fraunhofer SCAI,GER); J. Friebe, O. Vahid (Maplesoft Europe, GER)

14:20 **Differential Hypoid Gears: The Necessity for a Multi-Physics Approach**
S. Theodossiades, M. Mohammadpour, H. Rahnejat (University Loughborough, GBR)

14:45 Coffee break

Session 9 – Applications

15:15 **High Fidelity FE Model of Clamp Band System with Catcher Mechanism**
M. Such (ESA/ESTEC, NED)

15:40 **Advanced Multi-Body Modelling of Rotor Blades: Validation and Application in a Design Situation on the Basis of the 61.5m UpWind Blade**
S. Mulski, H. Mabou, S. Dietz (Simpack, GER); L. Schön (REpower Systems, GER); S. Hauptmann (Mesh Engineering, GER)

16:05 **A Comparative Study Between Beam Elements and Full Finite Elements Models for Blade Modeling of Wind Turbines**
J. Zeischka, J. Beuse (MSC Software, GER); H. Dekker, G. de Winkel (Knowledge Centre WMC, NED)

16:30 **Impact of Geometry Simplification and Element Size on the FEM-MBS-Coupling-Process**
C. Lein, M. Beitelschmidt (Technical University Dresden, GER)

16:55 **Wrap-up / Farewell**
G. Baldesi (ESA/ESTEC, NED); P. Morelle (LMS, BEL)

17:00 End of conference

Conference venue

Le Meridien Parkhotel Frankfurt
Wiesenhüttenplatz 28 - 38
60329 Frankfurt, Germany
Phone +49 69 2697 0, Fax +49 69 2697 884
E-Mail: info.frankfurt@lemeridien.com
www.lemeridien.com/frankfurt

A limited number of reduced-price rooms have been reserved for conference delegates. Please book your hotel room by using the keyword"NAFEMS".

Exhibition and sponsorship

The conference will be accompanied by an exhibition of software and hardware vendors, solution providers, and consultants. There are several exhibition and sponsoring opportunities available.

Conference language

English

Registration fees

NAFEMS members:	Free

NAFEMS members can use seminar credits towards free attendance at this event.This event will charge four seminar credits per delegate.

Member without seminar credits:	490 Euro.
Non NAFEMS members:	695 Euro.

The registration fee includes conference attendance, proceedings, lunches, break refreshments and get together. Hotel accommodation is not included.
All plus VAT if applicable.

Contact and further information

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Computational Structural Mechanics Working Group

The Computational Structural Mechanics Working Group provides a forum for everyone with an interest in Computational Structural Mechanics to discuss issues of mutual interest, while at the same time initiating and directing activities of benefit to NAFEMS members as a whole through publications, seminars, and workshops. The Group also acts as NAFEMS' technology centre in this area and interact with industry and academic experts in order to provide an authoritative response to technical issues within its remit. The Group works closely with other working groups and seeks to complement their activities.
More information: www.nafems.org/tech/csm

Multi Body Dynamics Working Group

Involving industrialists, consultants, vendors, and academia researchers, the Multi-body Dynamics Working Group (MBD-WG) will provide a framework for fostering discussions on the state-of-the-art of multibody dynamics theory and for sharing lesson learnt of simulating from different applications, benchmark different multibody dynamics methodologies based on challenging and nonconventional applications, offer guidelines and recommendations to user community, suggest multibody research development based on real-life applications, highlight benefits gained using Multi-body Dynamics Software, and foster the collaborations with other NAFEMS technical working groups.
More information: www.nafems.org/tech/mbd

More information about the conference and online registration at www.nafems.org/mbs2013

Please complete and fax to +49 - 80 51 – 96 74 3 37

or send registration form by e-mail to roger.oswald@nafems.org

❑ I herewith register for the NAFEMS European Conference:
Coupled MBS – FE Applications: A New Trend in Simulation
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- ❑ I am NAFEMS member free using 4 seminar credits
- ❑ I am NAFEMS member – no more seminar credits available: 490,– Euro plus VAT
- ❑ I am not NAFEMS member: 695,– Euro plus VAT

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