

SIMPACKNews

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Simpack User Meeting 2006 at the Kurhaus, Baden-Baden, South West Germany

SIMPACK User Meeting 2006 - A Review

The 7th SIMPACK User Meeting took place on the 21st and 22nd of March in the magnificent 'Kurhaus' in Baden-Baden in South West Germany. The circular hall with its baroque stucco work was used for most of the presentations; the presentations as always coming from both INTEC and the SIMPACK users. The two days of the User Meeting offered a full programme, including what INTEC is currently focussing on as well as nearly 30 presentations from SIMPACK users. This year the presentations came from users from ten different countries. The User Meeting presentations can be downloaded from www.simpack.com (software, publications).

The Kurhaus in Baden-Baden was built as a spa resort at the turn of the 19th century. To this day it is still used as a health and wellness centre. It also of course houses the famous casino. For these two days, however, the entire first floor was reserved for the SIMPACK User Meeting. As is the tradition, the User Meeting was opened with a very enlightening presentation from Lutz Mauer. He gave us an insight into the cultural background of Baden-Baden and the famous figures that have either come from the town or lived there over a number of years. These include Fjodor Dostojewski, Clara Schumann, Johannes Brahms and the architect Egon Eiermann.

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Erni Sabine Engert, INTEC GmbH

The SIMPACK User Meeting 2006

» WIND TURBINES 04

Stefan Hauptmann, University of Stuttgart

Integration of an Aerodynamic Wind Turbine Module

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Simon Wiedemann, Prof. Wallrapp, Munich University of Applied Sciences

Optimising the Modelling of Flexible Bodies in MBS

INTEC ON TRACK

Alex Eichberger reviewed what has been happening at INTEC since the last User Meeting. He also gave an insight into the commercial performance of INTEC which has shown continuous growth in all business divisions. The strength in international markets has also been further developed with new partners in France and Brazil. He also highlighted that the new devel-

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The Kurhaus Baden-Baden, Germany



The Auditorium Watches SIMPACK Animations in 3D View



Erik Pflieger, Siemens AG A&D, Germany

opments in SIMPACK 8.8 are heavily customer driven; these include more than 30 brand new features. These developments have been in all areas with the major focus on the modules SIMPACK Automotive and Engine, SIMPACK Wheel/Rail, SIMPACK Wind and SIMPACK Loads, Stress and Durability. A key feature of INTEC's future objectives is to provide the customers with interfaces which allow as much flexibility as possible in the overall CAE process.

WORKING WITH SIMPACK 8.8

Wolfgang Trautenberg focused in his presentation on the new post-processing module, which has now been extended from the highly capable new plot module to also include the animation of the simulation results. The animation offers 3D capabilities which were shown during the presentation. 3D glasses were handed out and the new capabilities of the animator were presented.

SIMPACK CODE EXPORT

Frank Kohlschmied presented the current functionality in SIMPACK's Code Export as well as the current development stage. For those that don't know SIMPACK Code Export is used for the automatic generation of the dynamic equations of a SIMPACK model as either Fortran or C code. The further developments to the SIMPACK Code Export include extensions to the solver functionality, new supported elements including elastic bodies, the export of C-code and more comfortable access to HIL environments.

SIMPACK GEARWHEEL

Lutz Mauer presented the SIMPACK Gearwheel module which he developed. He gave an in depth account of the theory behind this module including how the contact stiffness is calculated. The calculation is dependent on the overlap ratio and he showed how to calculate the optimum overlap ratio. He also presented some application examples of the Gearwheel module for use in an engine timing mechanism and in the simulation of wind

turbines.

SIMPACK ENGINE

Marcus Schittenhelm gave us a very informative presentation on the enhancements to the product suite SIMPACK Engine. This module can be used to simulate the dynamics of combustion engines and their corresponding excitations.

Whilst showing the enhancements in the field of modelling elements, solver methods, analysis processes and the model database, Mr. Schittenhelm highlighted the easy and effective SIMPACK Chain model set-up process and presented complete engine models which are used by SIMPACK users in the automotive industry.

MBS NUMERICAL METHODS IN SIMPACK

Martin Arnold, the leading expert on MBS numerical methods from the university Halle-Wittenberg, gave us a most impressive insight into SIMPACK's engine – the solver and its numerics. Beginning with the basics of SIMPACK time integration, he then went on to explain the different solvers available, what they can do and the respective advantages of using one solver over another.

His enthralling presentation captivated the audience and so it was elected as the best presentation at this year's User Meeting.

AUTOMOTIVE USER PRESENTATIONS

Thomas Ille (MAN Nutzfahrzeuge AG) presented the use of SIMPACK Code Export for the "easy-to-use" simulation for engineers without any SIMPACK know-how. This presentation, amongst the automotive presentations, was considered by the audience to be the best.

Sven Dronka (DaimlerChrysler AG) showed the development of a Co-Simulation interface for user force elements.

Darko Meljnikov (DaimlerChrysler AG) provided us with an insight into the use of SIMPACK at DaimlerChrysler Nutzfahrzeuge AG. He also presented the DaimlerChrysler Driving Simulator, which is in Berlin, that is used with the SIMPACK real-time models.

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Franz Huber (DaimlerChrysler AG) showed us the use of SIMPACK Engine for simulating engine timing chains. DaimlerChrysler switched in January of this year from using one of our competitor's tool to SIMPACK for simulating engine dynamics. Radek Tichanek from University Prague (CVUT) looked at the simulation of overhead camshafts. Basileios Mavroudakos (University of Stuttgart) showed us the potential of SIMPACK in chassis design for use in motor cycles and racing cars. Johannes Edelmann (University Vienna) showed a combined driver model for lateral and longitudinal vehicle dynamics. Andreas Gibbesch (DLR Oberpfaffenhofen) gave us an alternative, but excellent presentation, which demonstrated, with the help of SIMPACK, the planetary rover mobility on soft terrain. The use of SIMPACK for simulating rover mobility on Mars is obviously not the most common usage for SIMPACK in the automotive field, but showed the versatility of SIMPACK.

RAILWAY USER PRESENTATIONS

The presentations given by our SIMPACK Wheel/Rail users covered diverse railway topics. The event was very international with users coming from all over Europe. The first presentation came from Guido Saporito (AnsaldoBreda) and dealt with the DMU IC4 Car for DSB. Peter Häse (Bombardier) presented the drive train investigations he undertook for the Monorail in Las Vegas. He used SIMPACK to reduce the noise problems which had plagued the vehicle. Christophe Collette (University of Brussels) looked at the modelling of rutting corrugations and how they were validated with measured data. Pavel Polach (Skoda Vyzkum s.r.o.) went into great detail on how the simulation of railway car excitations are carried out on a virtual test rig. One of the highlights was the presentation from Roger Enblom (Bombardier Sweden); he showed us how he simulated the wear of railway wheel profiles over various different track sections. Nicola Bosso (Politecnico di Torino) presented the development of a spatial track module in SIMPACK and its application for simple roller coasters.

Peter Kotz (Siemens TS) showed us the application of the linear system analysis for railway vehicles as a mechatronic system. Claudia Kossmann and Karl Tillmetz gave an insight into the use of SIMPACK at Stadler Rail for Model Verification and Optimisation. Erik Pflieger (Siemens AG A&D) presented the simulation of the dynamic behaviour of nose-suspension drives. Bernhard Kurzeck (TU Berlin) presented his analysis of middle frequency range vibrations which occur in light railways whilst cornering. Antonio Carrarini (DLR Oberpfaffenhofen) closed the presentations and gave us an insight into an analysis of the stability of railway vehicles due to crosswinds.

MACHINERY DYNAMICS

An insight into the use of the Gear Pair Force Element for the advanced simulation of gearwheels was given by Saeed Ebrahimi (University Stuttgart). Janko Wuchatsch (University Magdeburg) showed us the use of SIMPACK for the simulation of piezo-electric and shape memory elements. Kersten Hahns (Voith Turbo) presentation shows the modelling of the drivetrain of a natural gas compressor.

WIND TURBINES/DRIVE TRAINS

This year we had once again two presentations from wind turbine specialists. Tobias Schulze (TU Dresden) gave us an impressive look at the state of the art dynamics used for the simulation of drivetrains, wind turbines, concrete mills and research ships. Jens Pfisters (Voith Turbo) presentation looked at the drive concept of wind energy plants at Voith Turbo. His presentation slides can be downloaded, like all the presentations, from www.simpack.com, software, publications, User Meeting 2006 in Baden-Baden.

We would very much like to thank all those who attended this year's User Meeting and particularly those who presented their work with SIMPACK.



Martin Arnold from University Halle-Wittenberg, Germany



Roger Enblom from Bombardier Transportation, Sweden



Thomas Ille from MAN Nutzfahrzeuge AG and Dr. Weber from Hilti AG, Germany