LSTC
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DYNA
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UPDATE

Invitation and Agenda

12th EUROPEAN LS-DYNA CONFERENCE

14 - 16 May 2019 – Koblenz, Germany

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Dear LS-DYNA user community,

With this agenda we would like to invite you cordially to the 12th European LS-DYNA Conference. This year the event will take place from 14 - 16 May in Koblenz, Germany. In the historical city, where the rivers Moselle and Rhine flow together, a first-class program with more than 200 presentations on all LS-DYNA applications awaits you.

In addition to the technical presentations, which will again take place 8 times in parallel, the keynote presentations by renowned speakers from industry and academia prove the high quality of the conference. This year we are pleased to welcome Niclas Brännberg (NIO), Prof. Hopperstadt (NTNU), Johan Jergeus (Volvo), Prof. Middendorf (University of Stuttgart), Mikael Palm (Husqvarna), Steven Peters (Daimler), Kishore Pydimarry (Honda), Ricardo Tejero de la Piedra (Opel), Tsuyoshi Yasuki (Toyota) as keynote speakers. Of course, the presentations of the developers from LSTC and DYNAmore are also again part of the program.

The accompanying software and hardware exhibition offers the possibility to exchange your experiences with other users. Staff from DYNAmore will also be available to answer your questions and provide tips and tricks. The popular workshops on various topics complete this year's agenda.

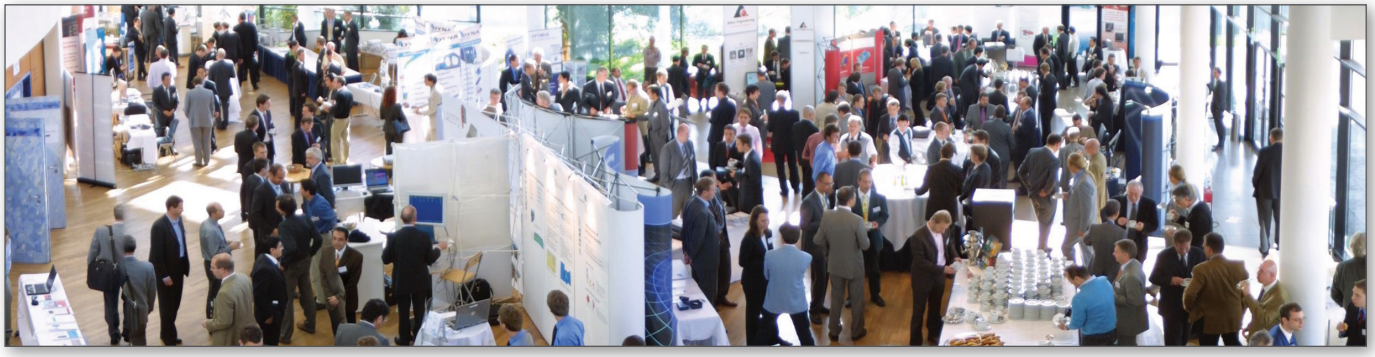
In addition, we offer conference accompanying seminars, which are held by experienced trainers and can be booked separately. Conference participants receive a 10% discount on the training prices. More information on the seminars can be found at the end of this booklet.

We hope to have aroused your interest and look forward to welcoming you in Koblenz.

Sincerely yours

LSTC Livermore Software Technology Corp.

DYNA MORE



Tuesday, 14 May

08:30	Pre-Conference Workshop: Material Characterization – From Tests to Material Cards							
12:45	Welcome/Keynote Presentations							
15:15	Vehicle Development I	Dummy Models	Optimization I	Forming I		Thermoplastic Materials I		
17:05	Vehicle Development II	Human Models Math. Models	Metallic Materials I	Forming II	Aerospace	Thermoplastic Materials II	Sim. Data Management I	Workshop Oasys
19:30	Get together: Food, drinks and live music in the exhibition hall							

Exhibition

Wednesday, 15 May

06:45	Running LS-DYNA (45 min. jogging)							
08:05	Railway & Comm. Vehicle	Restraint Systems	Fluid-Struct. Interaction	Forming III	High Speed Impact I	Thermoplastic Materials III	Sim. Data Management II	Workshop LS-OPT
09:40	Model Reduc-tion & Analysis	Airbags	Particle Method	Spotweld & Thermal I	High Speed Impact II	Fiber Reinf. Polymers I	LS-DYNA on Demand	Workshop BetaCAE
11:20	Keynote Presentations							
12:40	Lunch							
13:30	Keynote Presentations							
15:40	Electric Vehicle I	Impactors/ Barriers	Material Character. I	Isogeometric I	High Speed Impact III	Fiber Reinf. Polymers II	HPC I	Workshop LS-PrePost
17:25	Electric Vehicle II	Manufacturing I	WS: Phase Transformation	Isogeometric II	High Speed Impact IV	Wood & Foams	HPC II	Workshop SDM
19:00	Reception in the exhibition hall							
20:00	Gala dinner							

Exhibition

Thursday, 16 May

08:30	Connections	Manufacturing II	Metallic Materials II	Optimization II	High Speed Impact V	Fiber Reinf. Polymers III	Civil Engineering	Workshop GISSMO
10:40	Adhesive/ Rivets	Thermal II	Material Character. II	Optimization III	High Speed Impact VI	Fiber Reinf. Polymers IV	Implicit	Workshop LS-FORM
12:20	Lunch							
13:30	Keynote Presentations / Closing Remarks							
15:45	End of conference							

Exhibition

Friday, 17 May

10:00	The 2019 THUMS European Users' Meeting

AGENDA – TUESDAY, 14 MAY 2019

WELCOME – KEYNOTE PRESENTATIONS

12:45 **Welcome**
U. Franz (DYNAmore)

13:00 **Recent Developments in LS-DYNA – Part I**
J. Wang (LSTC)

13:30 **In Expectation of Reduced Model for Car Crash Simulation**
T. Yasuki (Toyota)

14:00 **Safety CAE for Real World Occupant Protection**
J. Jergeus, P.-A. Eggertsen, L. Jakobsson, L. Wågström, J. Östh, J. Hinder, E. Sandborg (Volvo Cars)

14:30 **Sponsor Presentation: Fujitsu/Intel**

T. Yasuki
Toyota

J. Jergeus
Volvo Cars

14:45 Break

VEHICLE DEVELOPMENT I

15:15 **A Study on Shell Element Sensitivity and Shell to Solid Modeling Transition**
J. He (Forming Simulation Technology); P. Du Bois (Consultant)

15:40 **Development of Carbon Fibre Floor Structure for Premium Electric SUV**
P. Bristo (NIO)

16:05 **Roof-Crush Analysis of the Volvo XC40 using the Implicit Solver in LS-DYNA**
A. Jonsson (DYNAmore Nordic); M. Carlberg (ÅF/Volvo Cars Consultant); T. Eriksson (Volvo Cars)

DUMMY MODELS

Sled Tests and Simulation Results with Q10 Update Kit Euro NCAP 2020
H. Ipek (Daimler)

Q10 Euro NCAP 2020 LS-DYNA Model Development
B. Been, K. Waagmeester, M. Burleigh, A. Lakshminarayana (Humanetics Europe); R. Jagadish (Humanetics)

Crash Test Dummies for Automated Vehicle Development
I. Maatouki, C. Kleessen, Z. Zhou, J. Wang (Humanetics)

OPTIMIZATION I

Load Case Preference Patterns based on Parameterized Pareto-Optimal Vehicle Design Concept Optimization
S. Ramnath (Ohio State University); N. Aulig, M. Bujny, S. Menzel (Honda Research Institute Europe); I. Gandikota (LSTC); K. Horner (Honda R&D Americas)

Structural Optimization of a Vehicle's Sill Subjected to Side Pole and Small Overlap Frontal Crash Load Cases
K. Alexandros, A. Kaloudis (BETA CAE Systems)

Expert Rules as a Powerful Support of the Topology Optimization Procedures of Crash Structures
Prof. A. Schumacher (University of Wuppertal)

FORMING I

The Benefit of True Fracture Strain on Material Model Parametrization
M. Schneider, M. Teschner, S. Westhäuser (Salzgitter Mannesmann Forschung)

Development New MAT Applied Yoshida 6th Order Yield Function and its Verification
H. Fukiharu, T. Amaishi (JSOL)

Evaluation of Simulation Results using Augmented Reality
M. Lechner, R. Schulte, M. Merlein (University of Erlangen-Nürnberg)

16:30 Break

VEHICLE DEVELOPMENT II

17:05 **Crash Simulation of Cast Iron Alloys with Nodular Graphite using Different Material Models**
D.-Z. Sun, F. Andrieux (Fraunhofer IWM)

17:30 **A Comparative Study of the Hexahedral Elements in LS-DYNA for Crashworthiness Simulation**
S. E. Hoque, S. Scheiblhofer, S. Ucsnik (LKR Leichtmetallkompetenzzentrum Ranshofen)

17:55 **Application of Vehicle Impact Simulation to Protective Barrier**
D. Aggromito, J. Farley, M. Walden (Arup)

18:20 **On the Setup and Simulation of Large Scale LEGO Models Build with LS-DYNA and LoCo**
T. Gerlinger, D. Koch, A. Haufe (DYNAmore); N. Karajan (DYNAmore Ohio); M. Thiele, A. Sahurnean (SCALE)

18:45 **FE Approach to Evaluate the Dynamic Friction Coefficient for the Transient Phase of Rubber-Ice Sliding Interaction**
A. Scattina, (Politecnico di Torino); R. Leonardi, S. Scalera (DYNAmore Italia)

HUMAN MODELS & MATH. MODELS

Multi Objective Optimization Approach for Biomedical Stent using Parametric Optimization
M. Seulin (DynaS+); P. Balu (DEP)

Musculoskeletal System Simulation in LS-DYNA using Continuum-Mechanical Approach
O. Avci (Fraunhofer IPA); Prof. O. Röhrle (University of Stuttgart)

The Effect of Element Formulation on FSI Heart Valve Simulations
G. Luraghi, F. Migliavacca, J. F. R. Matas (Politecnico di Milano)

Research Regarding the Mathematical Modelling of Cyclist Rear Collisions
O. A. Condrea (Transilvania University)

Effect of Side Incubator Padding on Unrestrained Child Crash Dummy under Deceleration Force
A. Rabiee (Cranfield University)

METALLIC MATERIALS I

Calibration and Application of GISSMO and *MAT_258 for Shell Element Simulations of High-Strength Steel
J. Johnsen, J. K. Holmen, D. Morin, M. Langseth (NTNU)

***MAT_258: A Through-Thickness Regularization Scheme for Shell Element Analyses – Application to Aluminium Components**
D. Morin, T. Berstad, M. Costas, O. S. Hopperstad, M. Langseth (NTNU)

A Hosford-Based Orthotropic Plasticity Model in LS-DYNA
F. Andrade (DYNAmore); T. Borrvall (DYNAmore Nordic); P. Du Bois (Consultant); M. Feucht (Daimler)

Modelling of Thermo-Viscoplastic Material Behavior Coupled with Nonlocal Ductile Damage
M. Nahrmann, Prof. A. Matzenmiller (University of Kassel)

FORMING II

Simulation of Sheet Metal Forming using Elastic Dies
M. Schill (DYNAmore Nordic); J. Pilthammar, M. Sigvant (Volvo Cars); V. Sjöblom, M. Lind (Blekinge Institute of Technology)

Shell Models with Enhanced Kinematics for Finite Elements in Sheet Metal Forming Simulations
T. Willmann, M. Bischoff (University of Stuttgart)

Numerical Simulation of Electrohydraulic Forming using Coupling of ALE and Lagrangian Elements
M. Woo, J. Kim (Pusan National University)

Modern Formability Simulation for Advanced High Strength Steel
C. Chen (eta)

The Use of LS-DYNA for the Development of a Topology-Optimized Thin-Walled Shell Structure Manufactured by Die-Less-Hydroforming
A. Metzger, T. Ummenhofer (KIT)

19:10 End of presentations

19:30 **GET TOGETHER – FOOD, DRINKS AND LIVE MUSIC IN THE EXHIBITION HALL**

THERMOPLASTIC MATERIALS I

15:15 **Approach for Modelling Thermoplastic Generative Designed Parts**
F. Althammer (Daimler/University of Stuttgart); D. Moncayo (Daimler); Prof. P. Middendorf (University of Stuttgart)

15:40 **A New Modelling for Damage Initiation and Propagation of Randomly-Oriented Thermoplastic Composites**
K. Saito, M. Nishi (JSOL); S. Hayashi, M. Kan (Honda R&D)

16:05 **A Viscoelastic-Viscoplastic Time-Temperature Equivalence for Thermoplastics**
V. Dorléans, E. Michau (Faurecia Interior System); R. Delille, F. Lauro, D. Notta-Cuvier, B. Bourel, G. Haugou, H. Morvan (University Polytechnique Hauts de France)

16:30

AEROSPACE

Design Qualification of the Jupiter Icy Moons Explorer JENI Instrument using the LS-DYNA Frequency Domain Suite
M. Shanaman, S. Cooper, S. Jaskulek, C. Schlemm, P. Brandt, D. Mitchell, E. Rollend (Johns Hopkins University)

Undamped Extension of a Nose Landing Gear
H. Frey (Liebherr Aerospace); W. Lietz, U. Stelzmann (Cadfem)

Methodological Approach to the Modelling of Tire/Ground Interaction
A. Al-Tayawe, H. Abhyankar, J. Brighton, V. Marchante-Rodriguez, G. Gent (Cranfield University)

THERMOPLASTIC MATERIALS II

Strength Assessment of an Electronic Plastic Component considering Local Fiber Orientation and Weld Lines
N. Schafet, M. Kuczynska (Robert Bosch); S. Pazour, W. Korte, M. Stojek (PART Engineering)

Failure Prediction for Polymer Products with Short Fiber
J. Takahashi, Y. Fujita (Asahi Kasei)

Modelling of Polypropylene Subjected to Impact Loading at Low Temperatures
E. Schwenke (NTNU)

SIMULATION DATA MANAGEMENT I

Implementation of a Method for the Generation of Representative Models of Polycrystalline Microstructures in LS-PrePost
S. Falco (Imperial College London); N. Bombace, N. Petrinic (University of Oxford); P. Brown (DSTL)

Automated Evaluation and Reporting of Simulation and Test Result Data integrated with CAE Process Workflow
A. Kumar, G. Geißler (SCALE)

Development of a Customized Beam-to-Shell Element Model Mapping Tool
M. Duhovic, P. Patil, D. Scheliga, D. Schommer, L. Münch, J. Hausmann (Institut für Verbundwerkstoffe)

Batch Meshing of Complex CAE Parts using Machine Learning
P. Krishnaswamy, U. Mallikarjuniah (Xitadel)

WORKSHOP

17:05 **Oasys PRIMER Workshop – Introduction and Demonstration of Automotive Tools**
G. Newland (Arup/Oasys)

Oasys PRIMER is used worldwide to pre-process LS-DYNA models. As well as the core tools for model creation and checking. PRIMER contains many tools to make it easier to setup automotive models/loadcases. This workshop will introduce these tools and demonstrate how to use them. Examples include:

17:30

17:55
- Barrier positioning.
- Pedestrian protection.
- Interior head impact.
- Seatbelt anchorage.
- Occupant setup.
- Automation.

18:20 Members of the Oasys team will also be on hand to answer any questions you have on PRIMER or any of the Oasys LS-DYNA products.

18:45

19:10

19:30 GET TOGETHER – FOOD, DRINKS AND LIVE MUSIC IN THE EXHIBITION HALL

Program subject to alterations.

AGENDA – WEDNESDAY, 15 MAY 2019

06:45 Running LS-DYNA (45 min. jogging)

MORNING SESSIONS

RAILWAY AND COMMERCIAL VEHICLE

08:30 **LS-DYNA Simulations of the Impacts of a 38-Ton Heavy Goods Vehicle into a Road Cable Barrier**
K. Wilde, D. Bruski, S. Burzyński, J. Chróścielewski, Ł. Pachocki, W. Witkowski (Gdańsk University of Technology)

08:55 **Transient Dynamic Implicit Analysis for Durability Testing of Bus Seats**
A. Jensen, G. Laird (Predictive Engineering)

RESTRAINT SYSTEM

08:05 **Virtual Testing of Curved Vehicle Restraint Systems**
B. Fröhlich (Bundesanstalt für Straßenwesen)

08:30 **Vehicle Restraint System Optimization and Robustness Assessment using the Coupling between LS-DYNA, LS-OPT and DEP MeshWorks Software**
C. Goubel (DynaS+)

08:55 **Numerical Simulations in Vehicle Restraint System Development**
M. Šebík, M. Popovič (SVS FEM); M. Drdlová (Research Institute for Building Materials)

FLUID-STRUCTURE INTERACTION

08:05 **Modelling of the Overcasting Reinforcement Process using the LS-DYNA ICFD Solver**
J. Burt, O. Tomlin (GRM Consulting); D. Howson, T. Fleet (Alvant)

08:30 **Recent and Future Developments for the ICFD Solver in LS-DYNA**
F. Del Pin, I. Caldichoury, R. R. Paz, C. Huang (LSTC)

08:55 **Parachute Deployment Simulations using LS-DYNA ICFD Solver and Strong FSI Coupling**
M. Le Garrec, A. Poncet, V. Lapoujade (DynaS+)

FORMING III

08:05 **Virtual Modeling of Forming Processes in Metal Packaging Industry**
I. Moldovan, M. Linnepe, L. Keßler (thyssenkrupp Steel Europe); M. Köhl (thyssenkrupp Packaging Steel)

08:30 **Setting up a Hot Stamping Simulation considering Tool Heating with OpenForm**
K. Kassem, D. Sihling (GNS)

08:55 **Springback in Assembly of Mirror Panels with Stamped Supports for Concentrating Solar Power Applications**
J. Pottas, J. Coventry (The Australian National University)

09:20 Break

MODEL REDUCTION & ANALYSIS

09:40 **Dimensionality Reduction of Crash and Impact Simulations using LS-DYNA**
C. Bach (BMW/Technical University of Munich); L. Song (BMW); T. Erhart (DYNAmore); Prof. F. Duddeck (Technical University of Munich/ Queen Mary University of London)

10:05 **Implementation of LS-DYNA / QUASAR Coupling for Model Reduction**
K. Kayvantash (CADLM); M. Takeda (JSOL); J. Wang (LSTC)

10:30 **Comparison of Laser-Scanned Test Results and Stochastic Simulation Results in Scatter Mode Space**
M. Okamura, H. Oda (JSOL); D. Borsotto (Sidact)

AIRBAGS

09:40 **Increasing CAE Productivity – Airbag Model Verification using Visual-Environment**
A. Lerch, N. Möwe (iSi Automotive); M. Seshadri, A. Gittens, M. Sommer (ESI)

10:05 **Airbag Folding for LS-DYNA using Generator4**
L. Benito Cia (GNS)

10:30 **Comparison of LS-DYNA Version 7, 9 and 11 – A View of an Airbag Supplier**
A. Seeger (iSi Automotive Berlin); S. Stahlschmidt (DYNAmore)

PARTICLE METHOD

09:40 **Implicit SPH in LS-DYNA for Automotive Water Wading Simulations**
E. Yreux (LSTC)

10:05 **Numerical Simulations of Vacuum Packed Particles using LS-DYNA**
P. Bartkowski, R. Zalewski (Warsaw University of Technology)

10:30 **Investigation on Parameter Identification and Coarse Graining Models using Discrete Element Capability in LS-DYNA**
S. Tokura (Tokura Simulation Research)

SPOTWELD & THERMAL I

09:40 **Prediction of Spot Weld Failure for Automotive Steels**
J. Lim, J. Ha (Posco)

10:05 **Recent LS-DYNA Developments in the Structural Conjugate Heat Transfer Solver**
T. Klöppel (DYNAmore)

10:30 **Tool Cooling Simulation for Hot Forming II. Experiments and Simulations**
T. Kuroiwa (JSOL)

10:55 Break

KEYNOTE PRESENTATIONS

11:20 **A Fly Landed on my Bumper and my Results Changed?**
K. Pydimarry (Honda R&D); A. Gromer (DYNAmore Ohio)

11:50 **Towards a Virtual Laboratory for Aluminium Structures**
Prof. O. S. Hopperstad (NTNU)

12:20 **Sponsor Presentation: Oracle**


K. Pydimarry
Honda


Prof. O. S. Hopperstad
NTNU

12:30 Lunch Break

HIGH SPEED IMPACT I

Determination of Impact Loads for a Tracked Military Vehicle during a Crash Scenario
B. Balaban (FNSS Savunma Sistemleri)

Armor Steel Impacted by Projectiles with Different Nose Shapes – Numerical Modelling
T. Fras, N. Faderl, L. Blanc (ISL); C. C. Roth, D. Mohr (ETH Zurich)

THERMOPLASTIC MATERIALS III

Failure Modeling of Unreinforced and Fiberreinforced Thermoplastics
P. Reithofer, B. Hirschmann, T. Schaffranek (4a engineering)

Constitutive Model of Filled Elastomers Capable of Capturing Mullins Effect, Hysteresis, Induced Anisotropy and Permanent Set – Part I: Model Theory & Implementation
R. Chandrasekaran, M. Hillgärtner, M. Itskov (RWTH Aachen University); M. Müller, F. Burbulla (Dr. Ing. h.c. F. Porsche)

Cont.: – Part II: Experiments & Validation
M. Hillgärtner, R. Chandrasekaran, M. Itskov (RWTH Aachen University); M. Müller, F. Burbulla (Dr. Ing. h.c. F. Porsche)

SIMULATION DATA MANAGEMENT II

Postprocessing of the 2020 EU-NCAP Frontal Impact Test in META
N. Tzolas, D. Siskos (BETA CAE Systems)

Animator4: Extended Representation of LS-DYNA Properties in Postprocessing
C. Kaulich, S. Hanson (GNS)

Multi Material Modeling with ANSA: An Application in the Automated Assembly Process in FORD
T. Fokylidis, V. Karatsis (BETA CAE Systems); U. Tunc, H. Wuestner (Ford-Werke); N. Pasligh (Ford Forschungszentrum Aachen); C. Ping, M. Ng (Ford Australia)

WORKSHOP

Material Parameter Identification with LS-OPT
K. Witowski (DYNAmore)

In this workshop a short introduction to LS-OPT will be given, and the application of LS-OPT for calibration of material parameters will be presented.

The new LS-OPT version 6.0 features for the usage of digital image correlation data for calibration of material parameters will be discussed by means of an application example.

08:05
08:30
08:55
09:20

HIGH SPEED IMPACT II

Simulation of Concurrent Detonation of Multiple High Explosive Charges
L. Schwer (Schwer Engineering & Consulting Services); S. Stojko, H. Bornstein (Defence Science and Technology Group)

Blast Detonated by Impact Simulation
M. Büyük (Sabanci University); H. Balaban, U. Penekli (FE-Tech)

Mesh Sensitivity of Blast Wave Propagation using 2D to 3D Mapping
D. A. Powell, D. Bogosian (Baker Engineering and Risk Consultants); L. Schwer (Schwer Engineering & Consulting Services)

FIBER REINFORCED POLYMERS I

Simulation Software Transversal Development of a TP Based Fiber Reinforced Composite Material Law
B. Eck (Faurecia Clean Mobility); J. Lacambre (DYNAmore France); Prof. P. Rozycki (Ecole Centrale de Nantes); M. Mbacke, T. Peret (IRT Jules Verne)

Design and Material Characterization of Reinforced Plastics for Secondary Structural Load Paths in an Early Development Phase
D. Moncayo (Daimler); M. Cyperling (Mercedes-Benz Werk); G. Dumitru, T. Graf (DYNAmore); D. Coutellier, H. Naceur (Université Polytechnique Hauts-de-France)

Prediction of Load-Bearing Capacity of Composite Cylinders with Impact Damage
A. Cherniaev (University of Windsor); V. Komarov, S. Pavlova, A. Pavlov (Samara University)

LS-DYNA ON DEMAND

LS-DYNA on Demand License
U. Göhner (DYNAmore)

Leveraging Rescale's Cloud HPC Simulation Platform to Run LS-DYNA Models and Accelerate Design Exploration: Examples and Case Studies
F. Treheux (Rescale)

High Performance Computing in Life Science
T. Newill, W. Dreyer (Oracle Cloud Infrastructure)

WORKSHOP

ANSA and META: Crash and Safety at its Best
BETA CAE Systems

ANSA and META offer a complete suite for Crash and Safety applications. Seats are moved easily to the desired position and dummies are positioned on them, achieving a penetration free and restrained, by seatbelts, system. Occupant Injury criteria for simulation and laboratory tests can be easily evaluated in META. Pedestrian analysts have at their disposal a complete tool for marking, bulk positioning and load-case creation for all desired targets and post processing capabilities for the evaluation of the corresponding results. All interior safety regulations available in the market are applicable in ANSA and META through automated tools for the safety of the driver and passengers.

09:40
10:05
10:30
10:55

CONSUMER PRODUCTS – NOT PRESENTED - ONLY IN PROCEEDINGS

Refrigerator Door Gasket Material Modeling and Magnetic Force Interpretation using LS-DYNA
N. D. Padghan, S. V Jagtap (Whirlpool of India)

Refrigerator Door Handle Side Impact in LS-DYNA Explicit
S. V. Jagtap, D. Thorat (Whirlpool Of India)

Testing and Validation of Dryer in Drop and Impact Simulations
S. Sridhar, S. Vishwakarma (Whirlpool of India)

Dishwasher Rack Loading Test to Fail in LS-DYNA Implicit
K. C. Kusupudi (Whirlpool of India)

Leakage Path Prediction for Active Vent Door System in LS-DYNA Implicit
K. C. Kusupudi (Whirlpool of India)

Failure Prediction of Plastics in Ball Impact Test
K. C. Kusupudi, S. Patil (Whirlpool of India)

Rubber Wear Estimation using LS-DYNA
C. Desai, S. Vishwakarma (Whirlpool of India); M. Schmidt, M. Hudak (Whirlpool Slovakia); S. Ostdiek (Whirlpool); D. Gupta (Whirlpool EMEA)

Failure Modeling of Expanded Polystyrene (EPS) Foam
C. Desai, S. Sridhar, S. Vishwakarma (Whirlpool of India)

AFTERNOON SESSIONS

KEYNOTE PRESENTATIONS

13:40 **Machine Learning as a Tool for Engineers**
S. Peters (Daimler)

14:10 **Virtual Vehicle Development at NIO**
N. Brännberg (NIO)

14:40 **Challenges in Occupant CAE: From Sled Test Simulation to Full Vehicle Crash**
R. Tejero de la Piedra (Opel Automobile)


S. Peters
Daimler


N. Brännberg
NIO


R. Tejero de la
Piedra, Opel

15:10 Break

ELECTRIC VEHICLE I

15:40 **Numerical Modeling and Prognosis of the Dynamic Response of High Voltage Components in Electric Cars**
M. S. Ridene (Daimler)

16:05 **Lithium-Ion Battery Models and Thermal Management in LS-DYNA**
K.-S. Im, Z.-C. Zhang, G. Cook Jr. (LSTC)

16:30 **BatMac: A Battery Macro Model to Simulate a Full Battery in an Electric or Hybrid Car Crash**
P. L'Eplattenier, I. Caldichoury (LSTC)

IMPACTORS/BARRIERS

The 3rd Generation Crash Barrier Modeling Method and Application on MDPB
Y. Wang (VAYU-TECH)

Development of Pedestrian Headform Finite Element (FE)Model using LS-DYNA and its Validation as per AIS 100/GTR 9
N. A. Kulkarni, S. R. Deshpande, R. S. Mahajan (The Automotive Research Association of India)

MATERIAL CHARACTERIZATION I

Development of a New Method for Strain Field Optimized Material Characterization
M. Benz, J. Irslinger, M. Feucht (Daimler); P. Du Bois (Consultant); M. Bischoff (University of Stuttgart)

Efficient Characteristic Identification of Plastic Materials for Crash Analysis with 3-Point Bending Machine
O. Ito, Y. Nakagawa, K. Kaneda, N. Matsuura, Y. Ueda (Honda R&D)

Automatized Kinetic and Strain Field Based Calibration for a Thermoplastic Material Model using High-Speed Tensile Tests
S. Schilling, P. Suppinger, P. Blome (Autoliv)

ISOGEOMETRIC I

Enabling the Analysis of Topologically Connected Multi-Patch Trimmed NURBS Shells in LS-DYNA
S. Hartmann (DYNAmore); L. Leidinger (BMW); L. Li , A. Nagy, M. Pigazzini, D. Benson (LSTC)

Explicit Isogeometric B-Rep Analysis on Trimmed NURBS-Based Multi-Patch CAD Models in LS-DYNA
L. Leidinger (BMW)

The ANSA / LS-DYNA Approach for IGA Simulations
L. Rorris, I. Chalkidis, A. Vafeidis (BETA CAE Systems); A. Nagy (LSTC); S. Hartmann (DYNAmore)

16:55 Break

ELECTRIC VEHICLE II

17:25 **Measurement of Electromagnetic Launcher Muzzle Velocity with Induced Voltage of B-Dot Probe**
H.-K. Kim, M.-A. Woo, J. Kim (Pusan National University)

17:50 **Battery Cooling Simulation using STAR-CCM+**
D. Grimmeisen, M. S. Schneider (Cascate)

MANUFACTURING I

Impact Analysis of Polymeric Additive Manufactured Lattice Structures
G. Laird (Predictive Engineering); P. Du Bois (Consultant)

Development of a Process Simulation Model of a Pultrusion Line
M. Duhovic, P. Aswale, D. Schommer, J. Hausmann (Institut für Verbundwerkstoffe)

18:15 **Coupling of a Foaming Process and Material Modeling with LS-DYNA**
T. Schäfer, C. Hinse (SimpaTec)

WORKSHOP

Phase Transformation of Metallic Materials
M. Merten, T. Klöppel (DYNAmore)

Several phase change models in LS-DYNA provide the possibility to numerically predict the distribution of process dependent material properties. The workshop gives a brief overview on existing models and discusses the recently developed material *MAT_254 in some detail. Possible approaches to calibrate this complex material model based on given experimental results are shown. In a first example, an isothermal TTT-Diagram is used to define a material card for the press hardening steel 22MnB5. A second show case demonstrates the potential application of the material model to the 'bake hardening' effect of 6xxx aluminium alloys.

ISOGEOMETRIC II

Isogeometric Analysis using the *IGA_INCLUDE_BEZIER Keyword in LS-DYNA
M. Sederberg (Coreform); M. Scott (Brigham Young University/Coreform)

Comparative Evaluation of Isogeometric Analysis and Classical FEM with Regard to Contact Analysis
Z. Naveed, A. Kühhorn, M. Kober (BTU Cottbus-Senftenberg)

18:40 End of presentations

19:00 **RECEPTION IN THE EXHIBITION HALL**

20:00 **GALA DINNER**


Courtesy of
Daimler AG


Courtesy of
Husqvarna AB


Courtesy of
Knorr-Bremse Systeme für
Schienenfahrzeuge GmbH


Courtesy of
Jaguar Land Rover Limited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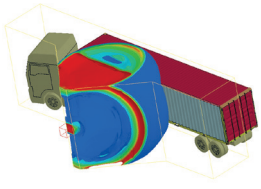
BMW Group


Courtesy of
Thiot Ingenierie

HIGH SPEED IMPACT III

Numerical Methods for the Analysis of Behind Armor Ballistic Trauma
P. Zochowski (Military Institute of Armament Technology)

Fluid-Composite Structure-Interaction in Underwater Shock Simulations
B. Özarmut, A. Rühl, B. Hennings, O. Nommensen, A. Paul (thyssenkrupp Marine Systems)

Bolted Joint Connections of FRP-Components in Submarines Subjected to Underwater Shock
A. Rühl, B. Özarmut, B. Hennings, O. Nommensen, A. Paul (thyssenkrupp Marine Systems)

FIBER REINFORCED POLYMERS II

Development of a User-Defined Material Model for Sheet Molding Compounds
D. Schommer, M. Duhovic, J. Hausmann (Institut für Verbundwerkstoffe); H. Andrae, K. Steiner (Fraunhofer ITWM); M. Schneider (KIT)

Adaptive Mesh Segmentation for Modelling Dynamic Delamination Initiation and Propagation in Thick Composite Laminates
J. Selvaraj, L. Kawashita, G. Allegri, S. Hallett (University of Bristol)

Numerical Investigation of Parameters Affecting Crush Mode of Triggered FRP Tube
R. Akita (Itochu Techno-Solutions Corporation); A. Koike (Isuzu Advanced Engineering Center); A. Yokoyama (Kyoto Institute of Technology)

HPC I

Dynamic Load Balancing
B. Wainscott (LSTC)

LS-DYNA Automatic Re-Decomposition
E. Yreux, C. Tsay, J. Wang (LSTC)

Leveraging LS-DYNA Explicit and Implicit on Latest Intel Technologies
N. Meng (Intel); J. Wang, R. Lucas (LSTC)

WORKSHOP

15:40 **Solution Explorer in LS-PrePost – a GUI for Nonlinear Implicit FE**
T. Borrvall (DYNAmore Nordic)

The evolvement of multiphysics capabilities in LS-DYNA has made it a very powerful, albeit somewhat complicated, simulation product. To this end, the Solution Explorer was introduced to simplify modeling setup in fluid mechanics, and this has now been complemented with a framework for nonlinear implicit mechanics. The vision of the Solution Explorer is to combine simplicity and power in an integrated pre- and post-environment, and this workshop presents its current state. We cover pre- and post-processing for single and multiple cases, in hope that it will provide a clear picture of its future potential.

16:55

HIGH SPEED IMPACT IV

Numerical and Experimental Investigation of SPH, SPG and FEM for High Velocity Impact Applications
M. Becker, M. Seidl (ISL); M. Mehl (University of Stuttgart); M. Souli (University of Lille)

Improvement of Satellites Shielding under High Velocity Impact using Advanced SPH Method
T. Legaud, M. Le Garrec, N. Van Dorsselaer, V. Lapoujade (DynaS+)

Random Vibration Analysis for a Gunner Platform Frame using Experimental Data
S. E. Yılmaz (FNSS Savunma Sistemleri)

WOOD & FOAMS

Comparison of Different Material Models in LS-DYNA (58, 143) for Modelling Solid Birch Wood
G. Baumann, F. Feist (Graz University of Technology); S. Hartmann (DYNAmore); U. Müller (University of Natural Resources and Applied Life Sciences); C. Kurzböck (ViF)

Modeling the Energy Absorption Characteristics of Wood Crash Elements
E. F. Akbulut Irmak (Paderborn University)

Modeling and Validation of Static and Dynamic Seat Cushion Characteristics
D. V. Dorugade (Concordia University); P.-E. Boileau (McGill University)

HPC II

The Effect of HDR InfiniBand on LS-DYNA Simulations
G. Cisneros-Stoianowski, O. Maor, G. Shainer, Y. Qin, D. Cho (HPC-AI Advisory Council)

Mainframe Computer Connector Wear Correlation and Prediction Analysis
S. Canfield, B. Notohardjono, R. Ecker, S. Khambati (IBM)

WORKSHOP

17:25 **Simulation Data Management with SCALE products**
M. Thiele (SCALE)

The workshop gives an overview of the SCALE SDM products such as LoCo, CAViT and Status.E. There will be a discussion on how to benefit from SCALE solutions as a user or project manager. The application of selected uses cases will be presented within live demos. Examples of typical CAE workflows and process automation using SCALE SDM applications are introduced. A lively discussion at the end of the workshop is very welcome to investigate a potential integration of SDM software in your environment.

17:50

18:15

18:40

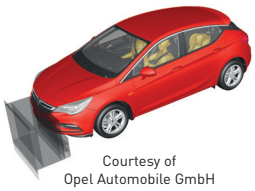
19:00 RECEPTION IN THE EXHIBITION HALL

20:00 GALA DINNER


Courtesy of Ford Forschungszentrum Aachen GmbH


Courtesy of Dr. Ing. h.c. F. Porsche AG


Courtesy of Autoliv & Volvo Cars


Courtesy of Opel Automobile GmbH


Courtesy of Honda R&D


Courtesy of Volvo Car Corporation

Program subject to alterations.

AGENDA – THURSDAY, 16 MAY 2019

	CONNECTIONS	MANUFACTURING II	METALLIC MATERIALS II	OPTIMIZATION II
08:30	**Development of Simple Connection Model for Plastic Parts in Low-Speed Crash Simulation** N. Matsuura, Y. Nakagawa, O. Ito, K. Kaneda, Y. Ueda (Honda R&D)	**Simulation of Process-Dependent Properties with MAT_254 Demonstrated for the ‚Bake-Hardening' of an 6xxx Aluminum Alloy** M. Merten, T. Klöppel (DYNAmore); S. Jurendic, Z. Liang (Novelis)	**Numerical Simulation of Low Velocity Impact on Sandwich Structures with Steel Skins and Polymer Foam Cores** T. Berstad, A. Reyes, T. Børvik (NTNU)	**Compact Lightweight Steel Hood Design and Development using ACP OpDesign** J. Stanik (Hyundai America Technical Center); A. Shrawan, D. Mittal, A. Farahani (ETA)
08:55	**Modeling of Bolts using the GISSMO Model for Crash Analysis** F. Schauwecker (Daimler/University of Stuttgart); M. Feucht, M. Beck, D. Moncayo (Daimler); F. Andrade (DYNAmore); Prof. P. Middendorf (University of Stuttgart)	**Simulating Time and Temperature dependent Artificial Ageing Process of an AA6xxx-T4 Aluminium Sheet Material using Mat 254** S. Jurendic, Z. Liang (Novelis); M. Merten, T. Klöppel (DYNAmore)	**High-Strength Alloyed Steel: Modelling Dynamic and Multiaxial Loading Conditions** A. Trippel (Institut für nachhaltige technische Systeme); W. Harwick (Fraunhofer EMI)	**Adaptive Sampling using LS-OPT** A. Basudhar (LSTC)
09:20	**Multi-Scale Numerical Simulations of Structural Joints with Flow-Drill Screws using a Virtual Material Calibration** M. Costas, D. Morin, M. Langseth (NTNU)	**Bake-Hardening Effects, Arbitrary Image Data and Finite Point-Set Analysis Results made Accessible with envyo** C. Liebold (DYNAmore); J. Zerbst (Daimler); S. Hagmann, M. Hedwig (Porsche)	**Influence of Strain Rate on Deformation and Failure Behavior of Sheet Metals under Shear Loading** S. Klitschke, A. Trondl, F. Huberth (Fraunhofer IWM)	**Parameter Estimation with LS-OPT: Addressing Noise, Hysteresis and Spurious Data in DIC and other Applications** S. Du Bois (DYNAmore); N. Stander, A. Basudhar (LSTC)
09:45	**Estimation of Spot Weld Design Parameters using Deep Learning** A. Pillai, Prof. U. Reuter (TU Dresden); M. Thiele (SCALE)	**Considering Manufacturing Induced Inhomogeneity in Structural Material Models (VMAP)** B. Jilka, P. Reithofer (4a engineering)	**MAT_291: A New Micromechanics-Inspired Model for Shape Memory Alloys** J. Karlsson (DYNAmore Nordic); S. Kari, R. Dhume, S. Kashyap (Medtronic)	**First Steps Towards Machine-Learning Supported Material Parameter Determination** D. Koch, A. Haufe (DYNAmore)
10:10	Break			
	ADHESIVE/RIVETS	**THERMAL II**	**MATERIAL CHARACTERIZATION II**	**OPTIMIZATION III**
10:40	**Simulation of Self-Piercing Riveting Process and Joint Failure with Focus on Material Damage and Failure Modelling** A. Rusia (Daimler/University of Stuttgart); M. Beck (Daimler); Prof. S. Weihe (University of Stuttgart)	**Validation of a Thermal Radiation Problem using *BOUNDARY_ RADIATION_ENCLOSURE** G. Blankenhorn, R. Grimes, F.-H. Rouet, I. Gandikota (LSTC); S. Malcom, B. Gyesi (Honda R&D)	**New Testing in Support of LS-DYNA MAT 224 Material Model** Prof. A. Gilat, J. Seidt, N. Spulak, J. Smith (Ohio State University)	**LS-TaSC 4: Designing for the Combination of Impact, Statics and NVH** K. Witowski (DYNAmore)
11:05	**Modelling of Steel-Aluminium Components using Structural Adhesive and Self-Piercing Rivets** D. Morin, M. Reil, T. Berstad, M. Costas, M. Langseth (NTNU)	**Validation of a Newly Developed Cross-Flow High Temperature Heat Exchanger (HT-HE) using Multiphysics Simulation** M. Rübsam, Prof. R. Altensen, Prof. M. Pitzer (THM)	**A Full-Field Calibration Approach to Identify Failure Parameters of a HS-Steel** S. Cavariani, A. Scattina (Politecnico di Torino); S. Scalera (DYNAmore Italia); D. De Caro, M. M. Tedesco, F. D'Aiuto, S. Bianco, A. Luera, D. Ghisleri (C.R.F.); C. Ilg (DYNAmore)	**Topology Optimization of a U-Bend Tool using LS-TaSC** D. Aspenberg (DYNAmore Nordic); N. Asnafi (School of Science & Technology)
11:30	**A Cohesive Model for Ice and its Verification with Tensile Splitting Tests** H. Herrnring, L. Kellner, J. M. Kubiczek, S. Ehlers (TUHH)	**Using a Rolls-Royce Dummy Engine Model to Evaluate Scalability of LS-DYNA Thermal Solvers** G. Blankenhorn, J. Wang, R. Grimes, F.-H. Rouet (LSTC); J. Ong (Rolls-Royce)	**Estimation of Stress Triaxiality from Optically Measured Strain Fields** S. Conde, F. Andrade, M. Helbig, A. Haufe (DYNAmore); M. Feucht (Daimler)	**Design Optimisation of a Side Impact Beam Made out of High Strength Aluminium Alloys using Barlat YLD2000 and GISSMO Failure Model for the "Extended Hotforming Process"** J. M. Schlosser, S. Mouchtar, W. Rimkus, R. Schneider (Hochschule Aalen)
11:55	**Modelling of Bonded Component Tests, Comparing MAT_240 to State of the Art Models** J. F. Berntsen, D. Morin, A. Holm Clausen, M. Langseth (NTNU)	**Simulation of the Temperature Distribution in Ship Structures for the Determination of Temperature-Dependent Material Properties** J. M. Kubiczek, H. Herrnring, L. Kellner, S. Ehlers (TUHH); R. Diewald (TÜV NORD EnSys)	**New Developments in Material Testing at Very High Strain Rates** R. Grams, X. F. Fang (University of Siegen)	
12:20	Lunch break			

KEYNOTE PRESENTATIONS – FAREWELL

13:30 **Fusion of Composite Simulation with Enhanced Data Acquisition and Data Science: Opportunities and First Approaches**
Prof. P. Middendorf (University of Stuttgart)

14:00 **Drop and Impact Simulation of Handheld Outdoor Products with LS-DYNA and Digimat**
M. Palm (Husqvarna Group)

14:30 **Recent Advances in Finite Element and Meshfree Methods for Material Failure Analysis**
Y. Wu (LSTC)

15:00 **Recent Developments in LS-DYNA – Part II**
T. Erhart (DYNAmore); T. Borrvall (DYNAmore Nordic)

15:30 **Farewell**
T. Münz (DYNAmore)

Prof. P. Middendorf
University of Stuttgart

M. Palm
Husqvarna Group

15:45 End of conference

HIGH SPEED IMPACT V

Blast Loading of Concrete: Simulations of Tubular Structures Subjected to Internal Detonations
M. Kristoffersen, T. Børvik (NTNU); K. O. Hauge (Norwegian Defence Estates Agency); A. Minoretti (Norwegian Public Roads Administration)

Study on Blast and Ballistic Loading of Auxetic Composite Sandwich Panels with LS-DYNA
N. Novak, L. Starčevič, M. Vesenjak, Prof. Z. Ren (University of Maribor)

Ballistic Behaviour of UHMWPE Composite Material: Experimental Characterization and Numerical Simulation
H. Abdulhamid, P. Deconinck, P.-L. Héreil, J. Mespoulet (Thiot-Ingenierie)

Modelling Back Face Deformation of Woven Layered Composite Targets under Oblique Impact
M. Seidl, N. Faderl, M. Becker (ISL)

FIBER REINFORCED POLYMERS III

Composites in High Voltage Applications
C. Weinberger, M. Rollant (4a engineering)

Polypropylene Composites under Impact: Anisotropy, Mapping and Failure Criteria in Simulations, and Validation on a Part for Building and Construction Industry
M. Nutini, M. Vitali (Basell Poliolefine Italia, a LyondellBasell Company); M. Benanti, S. Formolo (Polytech)

A Simple Material Model for Composite Based on Elements with Realistic Stiffness
T. Tryland (Sintef Manufacturing)

Design Right at the First Time Automotive Components by using Advanced Multiscale Approach with Digimat
H. Skhiri (e-Xstream)

CIVIL ENGINEERING

Drag Force Simulation on Blast Loaded Fabric Roof
M. Hadjioannou, E. Sammarco, M. Barsotti (Protection Engineering Consultants)

LS-DYNA on the West White Rose Project
J. Fisk (Arup)

Use of LS-DYNA for Structural Fire Engineering
E. Rackauskaite, G. Flint, A. Maani, A. Temple, P. Kotsovinos (Arup)

Low-Velocity Impact Behaviour of Plain Concrete Beam
D. Memon (Ghent University); D. Lecompte (Royal Military Academy of Brussels)

WORKSHOP

Failure Prediction in Crash Simulations with the GISSMO Model
F. Andrade (DYNAmore)

This workshop is indicated to all LS-DYNA users who want to take their first steps regarding failure modeling in crash simulations.

The subject will be addressed during the workshop where relevant aspects concerning failure prediction will be reviewed and the application of the GISSMO model for such simulations will be demonstrated.

08:30

08:55

09:20

09:45

10:10

HIGH SPEED IMPACT VI

Experimental and Numerical Study of Submillimeter-Sized Hypervelocity Impacts on Honeycomb Sandwich Structures
F. Plassard (Thiot-Ingenierie); H. Abdulhamid, P Deconinck, P-L Héreil, J. Mespoulet (Thiot-Ingenierie); C. Puillet (CNES)

Numerical Modeling of Honeycomb Structure Subjected to Blast Loading
M. Stanczak, T. Fras, L. Blanc (ISL); P. Pawlowski (Polish Academy of Sciences, Warsaw/ISL); A. Rusinek (Lorraine University)

High Velocity Impact Response of High Strength Aluminum using LS DYNA
G. Başaran, E. Özbayramoğlu, O. Bütün, E. Öney (FNSS Savunma Sistemleri); Prof. E. Gürses (Orta Doğu Teknik Üniversitesi)

IRIS 3 Program: Study of the Vibrations Induced by a Missile Impact on a Reinforced Concrete Structure
N. Van Dorsselaer, T. Legaud, V. Lapoujade (DynaS+); B. Richard (Institut de Radioprotection et de Sûreté Nucléaire)

FIBER REINFORCED POLYMERS IV

Composite Forming Simulation with Introduction to J-Composites/Form Modeler Version 2.0
M. Nishi, S. Wang, S. Dougherty (JSOL); X. Zhu (LSTC)

New Methods for Compression Molding Simulation and Component Strength Validation for Long Carbon Fiber Reinforced Thermoplastics
S. Hayashi (JSOL); C.T. Wu, W. Hu, Y. Wu, X. Pan, H. Chen (LSTC)

Modeling of Microcellular Short Fiber Reinforced Plastics for Pedestrian Safety Analysis
M. Landervik (DYNAmore Nordic); U. Westberg (Volvo Cars); S. Gastl (Borealis Polyolefine)

IMPLICIT

DDAM Analysis with LS-DYNA
Y. Huang, Z. Cui (LSTC)

FEM-BEM Coupling with Ferromagnetic Materials
T. Rüberg, L. Kielhorn, J. Zechner (Tailsit)

New Options in Frequency Domain Analysis and Fatigue Analysis with LS-DYNA
Y. Huang (LSTC)

Running Jet Engine Models on Thousands of Processors with LS-DYNA Implicit
C. Ashcraft, R. Grimes, R. Lucas, F.-H. Rouet (LSTC); J. Dawson, T.-T. Zhu (Cray); E. Guleryuz, S. Koric (NCSA); J. Ong, T. Simons (Rolls-Royce)

WORKSHOP

LS-DYNA with LS-FORM
X. Zhu, J. He (LSTC)

The workshops feature both informative and how-to knowledge with demonstrations of the latest features from experts.

The aim is to provide the attendees with insights, limits and merits of the topic. It facilitates the understanding by showcasing simple examples that explain the methods. Besides the presentation there will be time for interactions between the presenters and the audience.

10:40

11:05

11:30

11:55

12:20

Program subject to alterations.

SPONSORS

Platinum

Gold

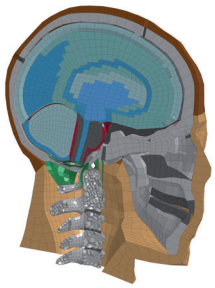
Silver

EXHIBITORS

4a engineering	DYNAmore	GNS Systems	Magna Steyr	SCALE
ARUP	DynaS+ / DEP	GOM Ges. für Optische Messtechnik	newgentechs	SIDACT
BETA CAE Systems	DynaWeld	Inprosim	NEC	Shanghai Enhu Information Technology
CADLM	e-Xstream engineering	Intel	Nordmetall	Shanghai Fangkun Software Technology
CASCATE	Fujitsu	JSOL	Oracle	T-Systems
CPU 24/7	Forming Technologies	Lasso	Predictive Engineering	Universität Erlangen-Nürnberg
DatapointLabs	GNS	LSTC	Rescale	extreme project

THE 2019 THUMS EUROPEAN USERS' MEETING

17 May 2019, Koblenz, Germany

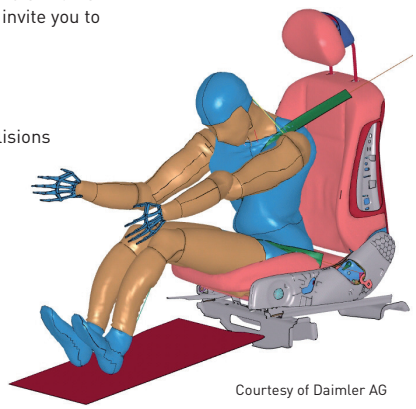


THUMS™

JSOL is delighted to announce The 2019 THUMS European Users' Meeting. THUMS, the Total Human Model for Safety for use with LS-DYNA is being rapidly adopted by users worldwide. We invite you to join us and share in THUMS technical information.

10:30	Introdction & THUMS Modeling T. Miyachi (JSOL)
10:45	Study of Occupant Kinematics in Automated Driving Vehicles during Frontal Collisions S. Hayashi (Toyota Motor Corporation)
11:30	Lunch
13:00	Presentation from customer
13:30	Presentation from customer
14:00	Presentation from customer
14:30	Investigation for Efficient Pre-Simulation Method in THUMS Application N. Ichinose (JSOL Corporation)
15:00	Closing Remarks

Program is subject to be changed.



Courtesy of Daimler AG

Venue:
Koblenz Kongress - Rhein-Mosel-Halle
Julius-Wegeler-Straße 4, 56068 Koblenz
Germany
www.koblenz-kongress.de

Organizer:
JSOL Corporation, www.jsol.co.jp/english

Registration:
www.jsol-cae.com/en/event/usersevent/2019/thums/

JSOL is looking forward to seeing you in Koblenz, Germany.

Pre-Conference Workshop: Material Characterization – From Tests to Material Cards

Date: 14 May, 08:30 - 11:30
Course fee: Free of charge
Location: Koblenz, Germany
Lecturers from: 4a engineering, GOM, DYNAmore

In the workshop, live measurements of static and dynamic tensile tests will be performed. Furthermore, the workshop includes the evaluation of the test data and shows possible approaches for the parameter identification of material cards.

ALE and FSI

Date: 13 May
Course fee: 600 Euro*
Location: Koblenz, Germany
Lecturer: M. Souli (Université Lille)

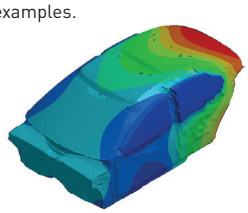
In this seminar, you receive comprehensive information directly from one of the program developers about the latest developments of the features provided by the solver LS-DYNA to analyse fluids and, in particular, the fluid-structure interaction using its Arbitrary Lagrangean Eulerian (ALE) capabilities. The theoretical background to fluid modeling in LS-DYNA is presented and illustrated with several practical applications. Problems solved during the workshop include tank sloshing, tank dropping (partially and completely filled), viscous flow in a channel, underwater explosion, bird strike, ship collision and acoustics in air and water. The seminar is directed towards advanced LS-DYNA users, whereas prior knowledge of fluid dynamics is not required.

Courtesy of Hankook Tire Co.

NVH, Frequency Domain and Fatigue with LS-DYNA

Date: 13 May
Course fee: 600 Euro*
Location: Koblenz, Germany
Lecturer: Y. Huang (LSTC)

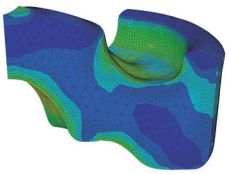
The objective of the training course is to introduce the frequency domain vibration, fatigue and acoustic features of LS-DYNA to users, and give a detailed look at the application of these features in vehicle NVH simulation. This course is recommended for engineers who want to run NVH or other frequency domain vibration, fatigue and acoustic simulation problems with LS-DYNA. This course is useful for engineers and researchers who are working in the area of vehicle NVH, aircraft/spacecraft vibro-acoustics, engine noise simulation, machine vibration testing and simulation, etc. Please note: This regular 2-day course was condensed to a one day course without workshop examples.



Introduction to SPG Method for Manufacturing and Material Failure Analysis

Date: 13 May
Course fee: 600 Euro*
Location: Koblenz, Germany
Lecturer: Y. Wu (LSTC)

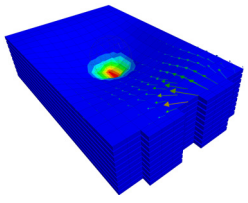
This one-day class will introduce the smoothed particle Galerkin (SPG) method and its application in manufacturing and material failure analysis. The SPG method is developed for modeling large deformation and material failure in semi-brittle and ductile materials in three-dimensional solid structures, in which a bond-based failure mechanism is utilized to model material failure. This method can be used to bridge the Lagrangian FEM and is exclusively available in LS-DYNA. The class will provide the fundamental background, LS-DYNA keywords, practical applications (in analyzing relatively low speed manufacturing processes such as metal cutting, FDS, SPR and high velocity impact penetration on concrete and metal targets) with some experimental validations and latest developments.



Resistive Heating and Battery Modeling

Date: 13 May
Course fee: 600 Euro*
Location: Koblenz, Germany
Lecturer: I. Çaldichoury (LSTC)

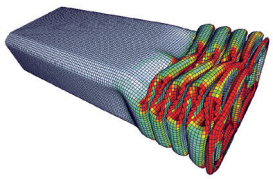
This course is based on the Electromagnetics (EM) solver of LS-DYNA. The EM module computes the Maxwell equations and is embedded into LS-DYNA following LSTCs one-code strategy, thereby allowing for an efficiently coupling to the solid-mechanics and the thermal solver. The seminar presents the solver's general principles, a complete keyword description for setting up simulation models, on the one hand, to compute inductive and resistive heating problems. On the other hand, the modelling of batteries is addressed. Thereby exploiting the Randles-circuit approach to describe the charging and discharging process as well as the accompanying heat production.



Element Types and Nonlinear Aspects

Date: 17 May
Course fee: 525 Euro*
Location: Koblenz, Germany
Lecturer: A. Haufe (DYNAmore)

This seminar is a collection of different topics on nonlinear aspects surrounding LS-DYNA. Emphasis is directed towards element technology and the specific elements implemented in LS-DYNA. In addition, adaptive schemes for nonlinear problems are presented. Since more and more implicit features are included in LS-DYNA, another part of the class is dealing with implicit solver technology for nonlinear problems.Please note: This regular 2-day course was condensed to a one day course without workshop examples.



Simulation of Short Fiber Reinforced Composites

Date: 17 May
Course fee: 525 Euro*
Location: Koblenz, Germany
Lecturer: C. Liebold, T. Klöppel (DYNAmore)

Besides standard plastic materials, more and more short and long fiber reinforced plastic materials are used to manufacture automotive components, aircraft parts, sports equipment etc. Since the local properties of this group of materials are highly dependent on the production process, not only new material models are necessary, which allow to consider the complex load bearing capabilities and damage mechanisms of these materials properly, but also new modeling techniques allowing to close the simulation process chain for these materials. In this course, material models being available in LS-DYNA for SFRP and LFRP components introduced and discussed. Since the consideration of the manufacturing process of such components plays an important role for a predictive structural analysis, different possibilities to consider process simulation results using the software tool ENVYO are shown. Thereby, several homogenization strategies and the respective input parameters will be discussed and illustrated in application examples.

Explosives Modeling for Engineers

Date: 17 May
Course fee: 600 Euro*
Location: Koblenz, Germany
Lecturers: P. Du Bois (Consultant), L. Schwer (Schwer Eng. & Consulting Services)

This class focuses on the application of LS-DYNA to modeling explosives. LS-DYNA simulations involving explosives can be modeled on several engineering levels from simple application of equivalent pressure histories via *LOAD_BLAST_ENHANCED, explicit inclusion of explosive charges using Equations-of-State and detonation via *IN-ITIAL_DETONATION, and detonation of explosive due to impact using *EOS_IGNITION_AND_GROW-TH_OF_REACTION_IN_HE. The analyst selects the appropriate degree of model sophistication to satisfy the intended use of the model results.

The modeling methods are illustrated through case studies with sufficient mathematical theory to provide the user with adequate knowledge to then confidently apply the appropriate modeling method.

This training class is intended for the LS-DYNA analyst possessing a comfortable command of the LS-DYNA keywords and options associated with typical Lagrange and Multi-Material Arbitrary Lagrange Eulerian (MM-ALE) analyses. The training class will attempt to provide the analyst with the additional tools and knowledge required to model explosives for a range of applications. The theory and illustrations portions of the class will benefit LS-DYNA users and non-LS-DYNA users alike.

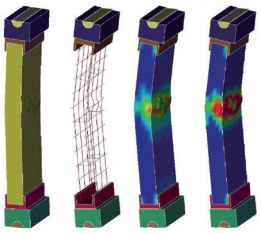
Concrete and Geomaterial Modeling

Date: 20 - 21 May
Course fee: 1,100 Euro*
Location: Stuttgart, Germany
Lecturer: L. Schwer (Schwer Eng. & Consulting Services)

Constitutive models for concrete and geomaterials (rock and soil) are typically based on the same mathematical plasticity theory framework used to model common metals. However, the constitutive behavior of concrete and geomaterials differs from that of metals in three important ways:

- They are (relatively) highly compressible, i.e., pressure-volume response;
- Their yield strengths depend on the mean stress (pressure), i.e. frictional response; and
- Their tensile strengths are small compared to their compressive strengths.

These basic differences give rise to interesting aspects of constitutive modeling that may not be familiar to engineers trained in classical metal plasticity.

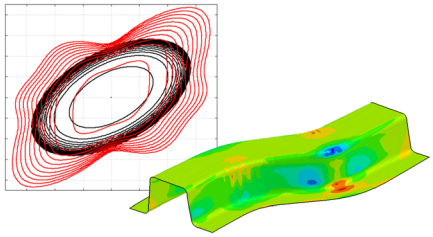


Courtesy of Schwer Engineering

Modeling Metallic Materials

Date: 20 - 21 May
Course fee: 1,050 Euro*
Location: Stuttgart, Germany
Lecturer: F. Andrade (DYNAmore)

Plenty of material models are available in LS-DYNA for describing the mechanical behavior of metallic materials. However, a profound understanding of the adopted material model is crucial for obtaining reasonable and reliable FE simulation results.

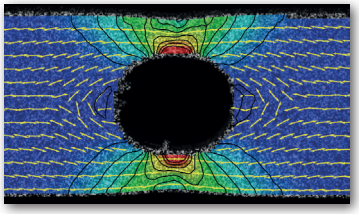


The aim of this class is to give practical guidelines about the application of the most commonly used material formulations. The focus will be especially on the underlying basic theory as well as on the assumptions made for the corresponding material formulations. Moreover, besides the practical information about particular input formats and the relevance of special settings, the algorithmic background of the various models will also be highlighted. Finally, diverse applications for the most commonly used metallic material models in LS-DYNA will be illustrated with the help of simple examples.

Parameter Identification with LS-OPT

Date: 22 May
Course fee: 525 Euro*
Location: Stuttgart, Germany
Lecturers: K. Witowski, C. Keisser (DYNAmore)

The use of new materials, such as plastics, composites, foams, fabrics or high-tensile steels, demands the application of highly complex material models. These material formulations are generally associated with numerous material parameters. The optimization program LS-OPT is ideally suited for identifying these parameters. In the identification process, an automatic comparison is carried out between the experimental results and the simulation results of LS-DYNA. Thereafter, the error between experiments and simulations is minimized.

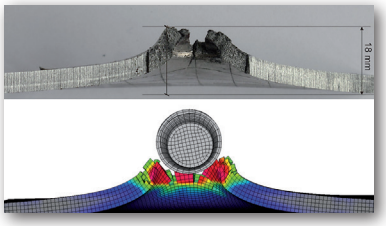


In this seminar, a brief introduction in LS-OPT is given with a focus on the application of LS-OPT to determine material parameters. No prior knowledge about optimization or the application of LS-OPT is required.

Material Failure

Date: 23 - 24 May
Course fee: 1,050 Euro*
Location: Stuttgart, Germany
Lecturers: F. Andrade (DYNAmore), M. Feucht (Daimler)

This seminar will discuss issues related to the adjustment of material models considering the failure, which can sometimes be relatively complex. The seminar intends to look at the complete picture, reaching from the approach to test design to the actual creation of a material card using LS-DYNA, thus reflecting the entire verification and validation process.



Courtesy of FVV (Forschungsvereinigung Verbrennungskraftmaschinen e.V.) and Inprosim GmbH

Introduction to PRIMER for LS-DYNA

Date: 23 May
Course fee: 525 Euro*
Location: Stuttgart, Germany
Lecturers: D. Kessler (DYNAmore)

The PRIMER preprocessor provided by our partner Arup is a high-performance solution to process and control LS-DYNA models. In addition to the range of features usually offered by a preprocessor, PRIMER can be used to implement very specific LS-DYNA settings, such as almost all available contact options, special joints or highly complex material models. PRIMER has been specially and exclusively designed for LS-DYNA as an FE solver. In many cases, PRIMER is also applied to check LS-DYNA models for errors or to remove superfluous entries that may cause problems. In addition, the program offers a range of special properties to model occupant safety simulations, such as dummy positioning, seat adjustment, seatbelt fitting, or airbag folding.

In this seminar the practical use of PRIMER is arranged for the participant. All important functions are described and demonstrated in the context of a Workshops. On the basis of many training examples the participant learns the safe operation for different areas of application.

The event is organised in collaboration with Ove Arup Systems, the developer and provider of PRIMER.

* 10% discount for conference participants. All prices plus VAT. Seminar fees include class notes, lunch, and drinks during the breaks. No reduced student places available.

Online registration at
www.dynamore.de/sem-ko-e

ORGANIZATION

Venue
Koblenz Kongress - Rhein-Mosel-Halle
Julius-Wegeler-Straße 4
D-56068 Koblenz, Germany
www.koblenz-kongress.de

Traveling to Koblenz
Parking spaces:
More than 1,250 underground parking spaces are available within walking distance of the two event locations Rhein-Mosel-Halle and Kurfürstliches Schloss.
Input into the navigation system:
Julius-Wegeler-Str. 4, 56068 Koblenz, Germany
By plane
Frankfurt Airport (approx. 110 km)
There is airect train connection from Frankfurt Airport to Koblenz
Frankfurt-Hahn Airport (approx. 80 km) and
Cologne-Bonn Airport (approx. 100 km)
Airport Düsseldorf (approx. 160 km)
By public transport
Stop Rhein-Mosel-Halle, Line 6, 8, 9, 10
The Rhein-Mosel-Halle can be reached on foot from the train station after a 15-minute walk (direction Rheinanlagen).

Accommodation
A limited number of reduced rooms for conference participants can be ordered through a central hotel room booking service. Please complete the booking form (pdf) on our website and send it to the following adress by 1 April at the latest:
Koblenz Congress
Carina Schneider, Julius-Wegeler-Str. 4, 56068 Koblenz
Tel.: +49 (0)261 - 9 14 81 - 10, Fax: +49 (0)261 - 9 14 81 - 22
E-Mail: schneider@koblenz-kongress.de

Participant fees
Participants from industry: 690 Euro (640 Euro early bird ticket before 1 April)
Participants from academia: 540 Euro (490 Euro early bird ticket before 1 April)
All prices plus VAT if applicable.
Fees include conference attendance, conference proceedings, gala dinner, lunches, coffee breaks, and attendance of the get together.

Hardware and software exhibition
More information under www.dynamore.de/exhibition2019.

Accompanying Seminars
The seminars will only take place if more than six attendees register.

Registration
Please use the the registration form, send an E-Mail to conference@dynamore.de or register online at www.dynamore.de/reg2019-e.

Conference language
English

Cancellation fees
In case of cancellation by the participant
- until one month before the conference starts: free of charge
- up to two days before the conference starts: 50%
From two days and no shows: 100%
Replacement participants will be accepted.

Contact
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E-Mail: conference@dynamore.de

More information
www.dynamore.de/conf2019

CONFERENCE ORGANIZERS

The conference will be organized by

In association with

DYNAmore Gesellschaft für FEM Ingenieurdienstleistungen mbH

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