

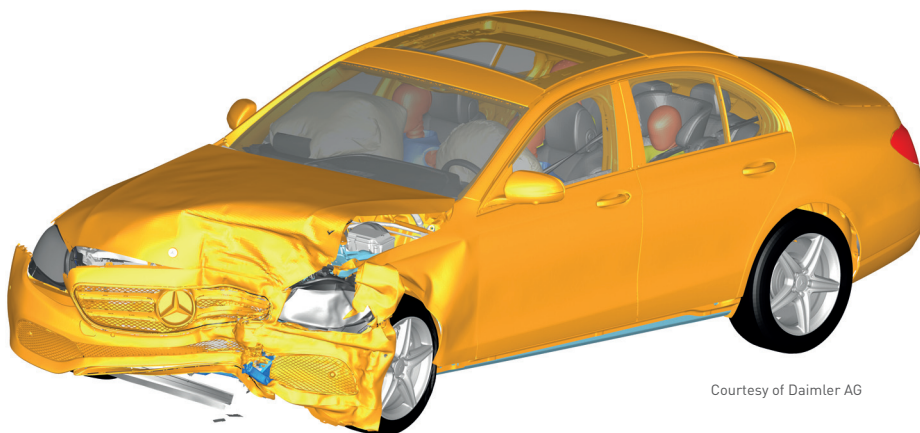
Conference Agenda

11th EUROPEAN LS-DYNA CONFERENCE

9 - 11 May 2017 – Salzburg, Austria



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Dear LS-DYNA user,

we would like to cordially welcome you to the 11th European LS-DYNA Conference in Salzburg, Austria.

Yet again, the conference has grown reaching almost 190 presentations and 8 workshops. A look into the agenda reveals the continuing popularity of the classical applications of LS-DYNA in the fields of crash analysis, material modeling, process simulation, blast simulation and failure modeling. Also remarkable is the number of talks on optimization and the ICFD solver, which has quickly evolved into a mature CFD tool for daily usage. Counting the numerous sessions on special topics, it is great to see how wide spread the application fields are.

Due to the Holiday "Victory in Europe" on Monday, the conference starts on Tuesday after lunch with keynote lectures followed by parallel sessions hosting user presentations. The workshops will be given to provide the opportunity for a straightforward introduction to application areas of LS-DYNA, which you might have wanted to know better for a long time.

On the first evening we will meet in the accompanying exhibition for dinner, drinks and live music. There will also be an official conference gala dinner taking place on the second evening.

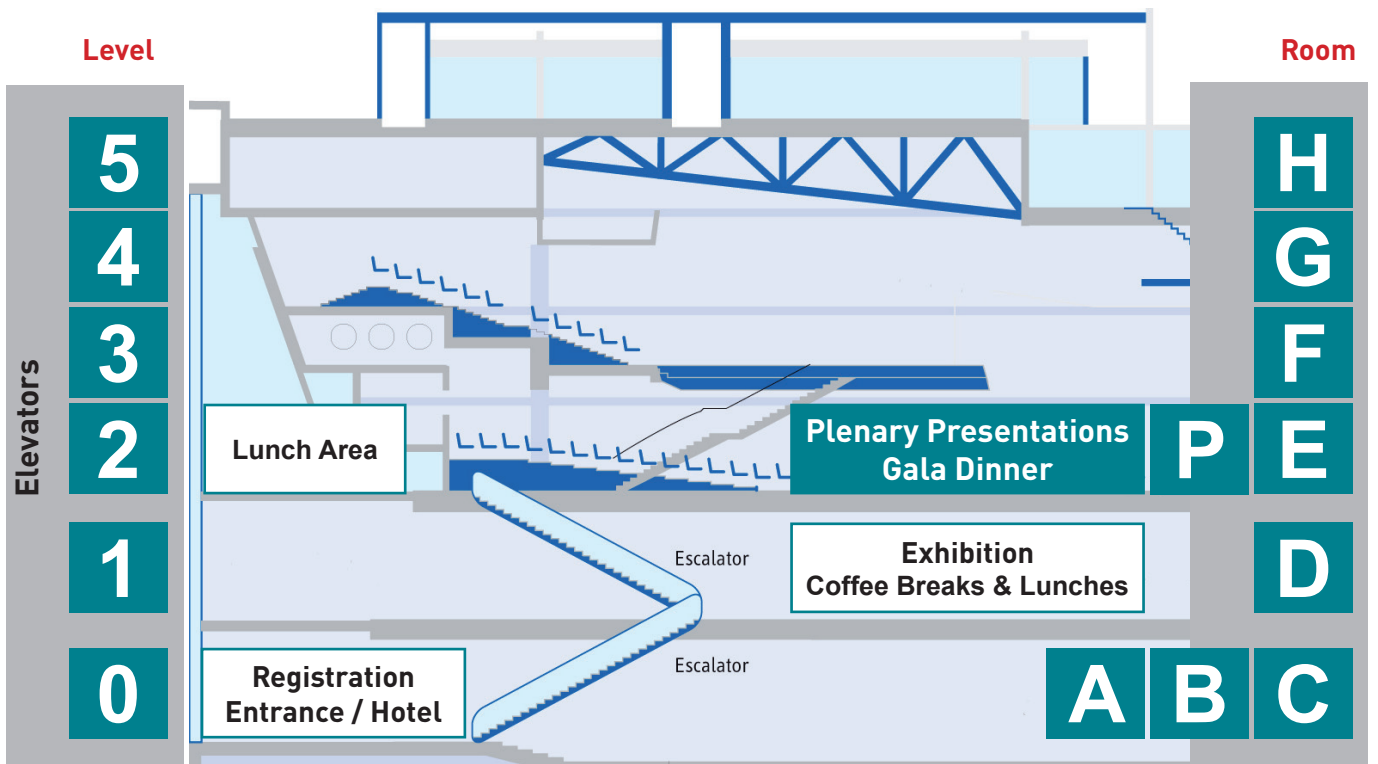
We hope that the conference will serve you as a great place to exchange your experiences and findings with other users of LS-DYNA and associated products.

Enjoy your time!

Sincerely yours



CONFERENCE ROOMS



Tuesday, 9 May

		L 2 – Plenary P							L = Level
Exhibition	12:55	Welcome/Keynote Presentations							
		L 0 – Room A	L 0 – Room B	L 0 – Room C	L 1 – Room D	L 3 – Room F	L 4 – Room G	L 2 – Room E	L 5 – Room H
	15:40	Crash Plastics Failure	Occupant Safety I	Process Metal Forming I	Materials Fiber Reinforced	Air Blast I	HPC & Cloud Computing		
	17:30	Crash Short Fiber	Occupant Safety II	Process Metal Forming II	Materials Plastics	Air Blast II	Cloud Computing	SDM / CAE Processes I	Workshop Welding
18:45	Get together - Food, drinks and live music in the exhibition hall								

Wednesday, 10 May

	07:15	Running LS-DYNA (45 min. jogging)							
Exhibition		L 0 – Room A	L 0 – Room B	L 0 – Room C	L 1 – Room D	L 3 – Room F	L 4 – Room G	L 2 – Room E	L 5 – Room H
	08:30	Crash Metal Failure	Optimization General	Process Connections	Materials Continuous Fiber	Concrete Under Blast Loading	ICFD Solver / FSI I	SDM / CAE Processes II	Workshop 4a / Impetus
	10:40	Crash Metal Failure	Optimization Topology	Process Hot Forming	Materials Arena 2036	Concrete Penetration	NVH	Workshop SDM / SCALE	Workshop ICFD Pre
	12:20	Lunch							
		L 2 – Plenary P							
	13:40	Keynote Presentations							
		L 0 – Room A	L 0 – Room B	L 0 – Room C	L 1 – Room D	L 3 – Room F	L 4 – Room G	L 2 – Room E	L 5 – Room H
	15:40	Crash Bake Hardening	Optimization Topol. / Robust.	Process Welding	Experiments / Parameters I	Metals Under Blast Loading	ICFD Solver / FSI II	Model Order Reduction	Workshop eta/DYNAFORM
	17:25	Crash Model Building	Occup. Safety CAE	Impact / Failure	Experiments / Parameters II	Armor Penetration	ICFD Solver / FSI III	Road Safety	Workshop ENVYO
	19:00	Reception in the exhibition hall							
	20:00	Gala dinner in L 2 – Plenary P (Europa Hall)							

Thursday, 11 May

		L 0 – Room A	L 0 – Room B	L 0 – Room C	L 1 – Room D	L 3 – Room F	L 4 – Room G	L 2 – Room E	L 5 – Room H
Exhibition	08:30	Crash Batteries / Tires	Ped. Safety Head Impact	Particles SPH / DEM	Materials Short Fiber	Mine Blast / Chemistry	Simulation Misc. I	Impact - Marine & Aviation	Workshop LS-OPT Robust.
	10:40	Crash Connections	Implicit Mechanics	Process Misc.	Materials Laminated Glass	Failure Misc.	Simulation Misc. II		Workshop Blast
	12:20	Lunch							
		L 2 – Plenary P							
	13:30	Keynote Presentations / Closing Remarks							
	15:15	End of conference							

L 2 – Plenary P

WELCOME – KEYNOTE PRESENTATIONS

- Chair: Prof. K. Schweizerhof (DYNAmore); D. Hilding (DYNAmore Nordic)
- 12:55 **Welcome**
U. Franz (DYNAmore)
- 13:05 **Recent Developments in LS-DYNA – Part I**
J. O. Hallquist, R. Grimes, J. Xu, G. Cook (LSTC)
- 13:45 **On Computational Strategies for Fluid-Structure Interaction: Algorithmic Developments and Applications**
Prof. D. Peric, W. G. Dettmer, C. Kadapa (Swansea University)
- 14:15 **CAE-Based Safety Development of the All-New Volvo S90/V90/V90CC**
J. Jergesus, D. Macri, P.-A. Eggertsen, I. Jenshagen, U. Westberg, M. Khoo (Volvo Cars)
- 14:45 **Sponsor Presentation: Fujitsu / Intel**
Presenters from Fujitsu Technology Solutions and Intel

15:00 Break

L 0 – Room A

CRASH – PLASTICS FAILURE

- Chair: T. Miyachi (JSOL)
- 15:40 **Implementation of a VE-VP Material Law for the Simulation of Energy Absorbing Thermoplastic Components**
P. Du Bois (Consultant); M. Feucht, J. Irslinger (Daimler); T. Erhart (DYNAmore)
- 16:05 **Modelling of Ductile Polymer Model for Crash Application**
Y. Ngueveu, S. Miyagano (Toyota Motor); F. Lauro (Universite de Valenciennes); R. Balieu (KTH Royal Institut of Technology)
- 16:30 **Characterization and Modeling of the Deformation and Failure Behavior of Neat Thermoplastic Homopolymers under Impact Loading Conditions**
P. Stelzer, Z. Major (University of Linz)

L 0 – Room B

Andreas Hirth Memorial Session

OCCUPANT SAFETY – DUMMIES

- Chair: S. Stahlschmidt (DYNAmore)
- Application of Reduced Model to Estimating Nij of HYBRID3 AF05 Dummy in Sled FE Simulation**
T. Yasuki (Toyota Motor)
- CAE Prediction of H-Point (Occupant Positioning in the Vehicle) using LS-DYNA, ARUP-HPM Tool**
C. G. Thangam, F. Eklöf, E. Mårtensson, P. Setterberg, J. Lindberg, S. Johnsson (Volvo Cars)
- Andreas Hirth's Contributions to the World of Occupant Safety Simulations**
Longtime work companions

L 0 – Room C

PROCESS – METAL FORMING – I

- Chair: Y. Drouadaine (ArcelorMittal)
- Forming Simulation, Meta Language and Input Decks**
M. Fleischer, J. Sarvas, H. Grass, J. Meinhardt (BMW Group)
- Experimental Validation of Detecting Surface Deflections on Sheet Metal Parts with LS-DYNA**
A. Weinschenk, A. Schrepfer, W. Volk (TU München)
- Advances in IGA for Sheet Metal Forming Applications**
S. Hartmann (DYNAmore); A. P. Nagy, D. J. Benson (LSTC)

L 1 – Room D

MATERIALS – FIBER REINF. PLASTICS

- Chair: P. Reithofer (4a engineering)
- A Modular Material Modeling Strategy for UD Composites and Organic Sheets using MFGenYld+CrachFEM**
M. Vogler, G. Oberhofer, H. Dell (MATFEM)
- Holistic Approach for Simulation Driven Design Process for Fiber Reinforced Plastics**
C. Hinsel, S. Kaul (SimpTec)
- Multi-Scale Modeling Technics Applied to a Multi-Material Design Context: SFRP, CFRP, Additive Manufacturing**
S. Calmels (e-Xstream)

16:55 Break

CRASH – SHORT FIBER

- Chair: J. Talbot (Arup)
- 17:30 **Simulation of Short Fiber Reinforced Plastics with LS-DYNA Considering Anisotropy, Rate Dependency and Rupture**
B. Lauterbach, M. Erzgraeber (Adam Opel); C. Liebold, A. Haufe, M. Helbig (DYNAmore)
- 17:55 **Stochastic Approach to Rupture Probability of Short Fiber Reinforced Polypropylene for Automotive Crash Applications**
N. Sygusch, B. Lauterbach (Adam Opel); N. Ruesch (Hochschule Darmstadt); S. Kolling (THM Gießen); J. Schneider (TU Darmstadt)
- 18:20 **Numerical-Experimental Correlation of Mechanical Tests on Fiber-Reinforced Polyamide Composites**
A. Molaro, M. Lanzillo, F. Uimbardi, A. Causa, B. Villacci (SAPA)

OCCUPANT SAFETY – LEGS & SEATS

- Chair: R. Taylor (Arup)
- Study of Occupant Lower Leg Injury Value Using Interface New Function**
T. Ishihara, H. Sugaya, K. Maehara, H. Mae (Honda R&D)
- THOR 5th Dummy FE Model Development**
A. Lakshminarayana, C. Shah (Humanetics)
- Physical Appearance Evaluation of Automotive Seat Structure with J-SEATdesigner**
N. Ichinose, H. Yagi (JSOL)

PROCESS – METAL FORMING – II

- Chair: M. Fleischer (BMW)
- Forming Simulations of Niobium Sheets – Upgrade of the Numerical Model and Outcome for Novel Productions**
A. Amorim Carvalho, M. Garlaschè, A. Dallochio, O. Capatina, L. Prever-Loiri, M. Narduzzi, J. Brachet, B. Bulat (CERN); L. Peroni, M. Scapin (Politecnico di Torino)
- New Features for Metal Forming in LS-DYNA**
X. Zhu, L. Zhang (LSTC); B. Hochholdinger (DYNAmore Swiss)
- Forming of Ultra-High-Strength Sheet Metals with Alternating Blank Draw-In**
R. Radonjic, M. Liewald (University of Stuttgart)

MATERIALS – PLASTICS

- Chair: Prof. S. Kolling (TH Mittelhessen)
- Computational Material Models for TSCP Plastics Comparison of the Deformation Behavior with MAT 24 and MAT SAMP-1 with DIEM**
M. Dobes, J. Navratil (Robert Bosch)
- Failure Models of Plastics – Material Characterization for *MAT_ADD_EROSION (DIEM)**
A. Fertschej, B. Hirschmann, M. Rollant, P. Reithofer (4a engineering)
- Creep Modeling of Plastic Components in Sealed Connectors**
H. E. Miled (Delphi Connecting Systems)

L 1 – Exhibition

18:45 **GET TOGETHER – FOOD, DRINKS AND LIVE MUSIC IN THE EXHIBITION HALL**



R. Grimes
LSTC



J. Xu
LSTC



G. Cook
LSTC



Prof. D. Peric
Swansea University



J. Jergeus
Volvo Cars

L 3 – Room F

AIR BLAST – I

Chair: J. Kennedy (KBS2)
Air Blast Reflection Ratios and Angle of Incidence
L. Schwer (SE&CS)

Comparison of MM-ALE and SPH Methods for Modeling Blast Wave Reflections of Flat and Shaped Surfaces
J. Trajkovski, R. Kunc, I. Prebil (University of Ljubljana)

Simulating Reinforced Concrete Beam-Column against Close-In Detonation using S-ALE
S. K. Tay, R. Chan, J. K. Poon (Ministry of Home Affairs)

AIR BLAST – II

Chair: P. Starke (Airbus Defence & Space)
A Review of S-ALE Solver for Blast Simulations
I. Kurtoglu, B. Balaban (FNSS Savunma Sistemleri)

A Comparison between Three Air Blast Simulation Techniques in LS-DYNA
H. Bento Rebelo, C. Cismasiu (Universidade NOVA de Lisboa)

Secondary Shocks and Afterburning: Some Observations
L. Schwer (SE&CS); S. Rigby (University of Sheffield)

L 4 – Room G

HPC & CLOUD COMPUTING

Chair: M. Bernreuther (HLRS)
Processor Count Independent Results: Challenges and Progress
B. Waincott, Z. Han (LSTC)

Maximizing Cluster Scalability for LS-DYNA
P. Lui, D. Cho, G. Lotto, G. Shainer (Mellanox Technologies)

On Demand Licensing with LS-DYNA
Prof. U. Göhner (DYNAmore)


CLOUD COMPUTING

Chair: A. Findling (Cray)
Leveraging Rescale's Cloud HPC Simulation Platform to Run LS-DYNA Models and Accelerate Design Exploration: Examples and Case Studies
W. Dreyer, T. Smith (Rescale)

HPC in the Cloud: Gcompute Support for LS-DYNA Simulations
I. Fernandez (Gcompute)

HPC in the Cloud – An Alternative to Cover "Just" Capacity Issues? Challenges & Outlook for Dynamic Scaling with LS-DYNA
A. Heine, J. Tamm (CPU 24/7)

Book of Abstracts (pdf):
www.dynamore.de/conf2017-abstracts



L 2 – Room E

SDM & CAE PROCESSES – I

Chair: H. Müllerschön (SCALE)
A Unified Environment for Processing Test Videos and Simulation Models
S. Kleidarias, V. Pavlidis (BETA CAE Systems)

Systems Engineering with Status.E and CAViT – Comparison and Assessment of CAT & CAE Data
G. Geißler, M. Liebscher, R. Hausdorf (SCALE); M. van der Hove (AUDI)

d3VIEW - Data to Decision Platform Development Update
S. Bala (LSTC)

L 5 – Room H

WORKSHOP

Welding Simulation
T. Loose (DynaWeld)

In this workshop, two simulation models will be presented addressing the Gas Metal Arc Welding of a T-joint as well as a Laser Welding overlap joint with a tension test.

Herein, the most important features of a welding simulation are discussed:

- preparation of material data
- single- and multi-phase materials
- aluminum and steel
- weldpath and weld sequence
- heat source and heat input control
- heat input simulation with SimWeld
- contact, clamps and loads

The workshop is closed with a short demonstration of the welding preprocessor DynaWeld.

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

AGENDA – WEDNESDAY, 10 MAY 2017

07:15 Running LS-DYNA (45 min. jogging)

MORNING SESSIONS

L 0 – Room A

CRASH – METAL FAILURE

Chair: K. Hohoff (Porsche Engineering)
 08:30 **Plastic Instability of Rate-Dependent Materials - A Theoretical Approach in Comparison to FE Analyses**
 C. Keller, U. Herbrich (Bundesanstalt für Materialforschung und -prüfung)

L 0 – Room B

OPTIMIZATION – GENERAL

Chair: B. Lauterbach (Opel)
 08:55 **Short Introduction of a New Generalized Damage Model**
 T. Erhart, F. Andrade (DYNAmore); P. Du Bois (Consultant)
 09:20 **Ductile Failure in Large-Scale Analyses of Aluminum Structures**
 D. Morin, T. Berstad, O.S. Hopperstad, M. Langseth (NTNU)
 09:45 **Characterization and Modeling of Anisotropic Behavior of Aluminum Profile**
 F. Andrieux, D. Sun (Fraunhofer IWM)

L 0 – Room C

PROCESS – CONNECTIONS

Chair: T. Loose (SimWeld)
 08:30 **Numerical Simulation of High-Speed Joining**
 M. Gerken, Prof. G. Meschut (University of Paderborn)
 08:55 **Continuous Simulations from Resistance Spot Welding Process to Joint Strength**
 S. Yagishita, T. Kawashima, N. Ma (JSOL)
 09:20 **Resistive Spot Welding Simulations Using LS-DYNA**
 P. L'Epattenier, I. Çaldichoury (LSTC); T. Loose (DynaWeld); U. Reisgen (RWTH Aachen)
 09:45 **Modeling of Curing Adhesives between Jointed Steel and Aluminum Plates using MAT_277 in LS-DYNA**
 S. Dong (Ohio State University); A. Smith, A. Sheldon (Honda R&D Americas)

L 1 – Room D

MATERIALS – CONTINUOUS FIBERS

Chair: H. Finckh (ITV Denkendorf)
 08:30 **Numerical Evaluation of Low-Speed Impact Behaviour of a Fabric Layered Composite Plate in an Industrial Context**
 S. Treutenaere, F. Lauro, B. Bennani, G. Haugou, W. Xu (University of Valenciennes); E. Mottola, T. Matsumoto (Toyota Motor)
 08:55 **Recent Developments and Application of *MAT_REINFORCED_THERMOPLASTIC**
 T. Klöppel (DYNAmore)

10:10 Break

CRASH – METAL FAILURE

OPTIMIZATION – TOPOLOGY

PROCESS – HOT FORMING

MATERIALS – ARENA 2036

Chair: J. Kauss (Daimler)
 10:40 **Modeling of Deformation and Damage Behavior of High Strength Steels under Multiaxial Crash Loading**
 D. Sun, A. Trondl, S. Klitschke (Fraunhofer IWM)
 11:05 **A Status Review of Failure Simulation at the Federal Aviation Administration**
 D. Cordasco, W. Emmerling (Federal Aviation Administration); P. Du Bois (Consultant)
 11:30 **A Comparison of Damage and Failure Models for the Failure Prediction of Dual-Phase Steels**
 F. Andrade (DYNAmore); M. Feucht (Daimler)
 11:55 **Applications of Multiscale and Subcycling Methods for Press Hardened Steel Parts Failure Assessment**
 Y. Drouadaine (ArcelorMittal)

Chair: N. Stander (LSTC)
 10:40 **Topology Optimization Methods based on Nonlinear and Dynamic Crash Simulations**
 Prof. F. Duddeck, M. Bujny, D. Zeng (TU München)
 11:05 **LS-TaSC Product Status**
 K. Witowski (DYNAmore); W. Roux (LSTC)
 11:30 **A Systematic Study on Topology Optimization of Crash Loaded Structures using LS-TaSC**
 K. Weider, A. Marschner, Prof. A. Schumacher (University of Wuppertal)

Chair: B. Hochholdinger (DYNAmore Swiss)
 10:40 **Hot Rolling Simulation of Aluminum Alloys using LS-DYNA**
 P. Simon, G. Falkinger (AMAG); S. Scheibelhofer (LKR Ranshofen)
 11:05 **Tool Cooling Simulation for Hot Forming**
 T. Kuroiwa (JSOL)
 11:30 **The Structural Conjugate Heat Transfer Solver – Recent Developments**
 T. Klöppel (DYNAmore)
 11:55 **An Analysis of the Hot-forming Process with Thermal and ICFD Simulations**
 M. Kintsch, S. Szabo, R. Schneider (Voestalpine Automotive Components); W. Rimkus (Hochschule Aalen)

Chair: M. Landervik (DYNAmore Nordic)
 10:40 **Investigating the Influence of Local Fibre Architecture in Textile Composites by the Help of a Mapping Tool**
 M. Vinot, M. Holzappel (DLR); C. Liebold (DYNAmore)
 11:05 **The Digital Prototype as Part of ENVYO – Development History and Applications within the ARENA2036 Environment**
 C. Liebold, A. Haufe (DYNAmore); M. Vinot (DLR); J. Dittmann, P. Böhler (University of Stuttgart); H. Finckh, F. Fritz (ITV Denkendorf)
 11:30 **Manufacturing Simulation as Part of the Digital Prototype**
 P. Böhler, J. Dittmann, D. Michaelis, P. Middendorf (University of Stuttgart); C. Liebold (DYNAmore)

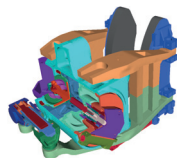
12:20 Lunch break



Courtesy of Daimler AG



Courtesy of Husqvarna AB



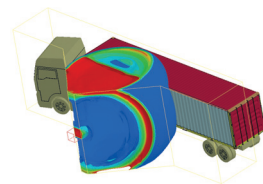
Courtesy of Knorr-Bremse Systeme für Schienenfahrzeuge GmbH



Courtesy of Jaguar Land Rover Limited



Courtesy of BMW Group



Courtesy of Thiot Ingenierie

L = Level

L 3 – Room F

CONCRETE UNDER BLAST LOAD

Chair: L. Schwer (SE&CS)
2D Modeling of Blast Induced Rock Damage around a Single Blasthole
A. Saadatmand Hashemi, T. Katsabanis (Queen's University)

Numerical Modeling of Concrete Response to High Strain Rate Loadings
 R. Sharath, D. Arumugam, B. Dhana-sekaran, T. Subash (Larsen & Toubro)

Numerical Prediction of the Dynamic Response of Prestressed and Reinforced Concrete Hollow Core Slabs Under Blast Loading
A. Maazoun, S. Matthys (Ghent University); J. Vantomme (Royal Military Academy)

Simulating Dynamic Loads on Concrete Components using the MM-ALE (Eulerian) Solver
 S. K. Tay, R. Chan, J. K. Poon (Ministry of Home Affairs)

L 4 – Room G

ICFD SOLVER & FSI – I

Chair: Prof. U. Göhner (DYNAmore)
Simulation of Fluid-Structure Interaction between Injection Medium and Balloon Catheter using ICFD
L. Wiesent, Prof. M. Wagner (OTH Regensburg)

Generalized Porous Media Flow in ICFD-LS-DYNA: FSI, Free-Surface, RTM and Parachute Modeling
R. Paz, F. Del Pin, I. Çaldichoury (LSTC); H. Castro (Conicet)

Effect of Porous Components on the Aerodynamics of a Bluff Body
S. Szymszowski, M. Pelacci, J. Aguero, D. Birch (University of Surrey); Y. Liu (Southwestern University)

Investigating the Post Processing of LS-DYNA in a Fully Immersive Environment
E. Helwig, F. Del Pin (LSTC)

L 2 – Room E

SDM & CAE PROCESSES II

Chair: S. Bala (LSTC)

Recent Developments in LoCo – Instant Collaboration in Simulation Data Management
R. Bitsche, M. Thiele, T. Landschoff (SCALE); M. Koch (Dr. Ing. h.c. F. Porsche)

Data Management and Loadcase Composition in ANSA
T. Fokilidis, L. Rorris, T. Loiras (BETA CAE Systems)

The Benefits of Scripting for CAE Engineers – How a Little Can Go a Long Way
 G. Newlands, M. Thornton (ARUP)

L 5 – Room H

WORKSHOP

MPIP - Material Parameter Identification Process with 4a impetus
 A. Fertschej, B. Jilka (4a eng.) 08:30

The material card generation using 4a impetus solution is shown exemplary for thermoplastic materials. The latest software features of 4a impetus are presented, especially the "Autofit" workflow and implementation of anisotropic material laws are main topics. New test methods focusing on failure estimation and component validation complete the workshop topics. 08:55

Besides the presentation there will be time for interactions between the presenters and the audience. 09:20

09:45

10:10

CONCRETE PENETRATION

Chair: F. Lancelot (Arup)
Assessment of the Capacity of a Reinforced Concrete Structure for Impact with Military Jet Aircraft
M. Miloshev, M. Kostov (Risk Engineering)

Evaluation of Debris Modeling Technique on Failure Simulation of Concrete Structures
S. Tokura (Tokura Simulation Research); K. Niwa (Terrabyte)

Comparison of the RHT Concrete Material Model in LS-DYNA and Ansys Autodyn
C. Heckötter, J. Sievers (GRS)

NVH

Chair: Prof. M. Souli (Université de Lille)
The Use of LS-DYNA for Body NVH "The Success so far"
T. Zeguer (Jaguar Land Rover); Y. Huang, M. Souli (LSTC)

Recent Developments for Frequency Domain Analysis in LS-DYNA
Y. Huang, Z. Cui (LSTC)

Acoustic Analysis for Impact Sound with LS-DYNA
R. Ishii (JSOL); T. Yamamoto (Nihon Emsco); Z. Cui, Y. Huang (LSTC)

A New Eigensolver for High Performance NVH Analysis: MCMS (Multi-Level Component Mode Synthesis)
 Prof. K. Chang-Wan (Konkuk University); R. Grimes (LSTC)

WORKSHOP

SDM and CAE-Processes with SCALE Solutions
 R. Bitsche, G. Geißler (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.

WORKSHOP

New LS-PrePost Interface for ICFD Preprocessing
 I. Çaldichoury (LSTC) 10:40

A new interface for model setup is under development in LS-PrePost where the user can easily assign physical properties and options for his model. LS-PrePost will then automatically translate the definitions into keyword format. 11:05

The current capabilities focus on the ICFD solver but will be extended in the future. 11:30

11:55

Program subject to alterations.



Courtesy of Ford Forschungszentrum Aachen GmbH



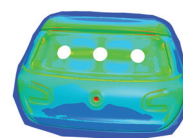
Courtesy of Dr. Ing. h.c. F. Porsche AG



Courtesy of Autoliv & Volvo Cars



Courtesy of Adam Opel AG



Courtesy of Volkswagen AG



Courtesy of Volvo Car Corporation

AFTERNOON SESSIONS

L 2 – Plenary P

KEYNOTE PRESENTATIONS

- Chair: M. Feucht (Daimler); A. Haufe (DYNAmore)
- 13:40 **You want me to do what?!**
E. DeHoff (Honda R&D Americas)
- 14:10 **Simulation of Mechanical Watches at IWC**
P. Steinhäuser (IWC Schaffhausen)
- 14:40 **Technical Challenges in the Integration of Hybrid-Components in New Automotive Concepts***
D. Moncayo, Prof. C. Glöggler (Daimler)
*subject to approval

15:10 Break

L 0 – Room A

CRASH – BAKE HARDENING

- Chair: B. Feng (Jaguar)
- 15:40 **Enhancing Fracture Prediction by Local Material Property Distribution – Feasibility Study**
D. Riemensperger (Adam Opel); A. Haufe (DYNAmore)

L 0 – Room B

OPTIMIZATION – TOPOL. & ROBUSTN.

- Chair: Prof. F. Duddeck (TU München)
- Topology Optimization of the Bogie Structure of a Tracked Military Vehicle**
K. Akcengiz, B. Balaban (FNSS Savunma Sistemleri)

L 0 – Room C

PROCESS – WELDING

- Chair: M. Schill (DYNAmore Nordic)
- Equivalent Energy Method for Welding Structure Analysis**
T. Loose, J. Rohbrecht (DynaWeld)

L 1 – Room D

EXPERIMENTS & PARAMETER OPT. – I

- Chair: H. Lu (Hengstar)
- New Generation Modeler for LS-DYNA Material Parameter Conversion**
H. Lobo, E. Strong, A. Beckwith (Matereality)

- 16:05 **FE Implementation of AA6xxx Series Aluminum Pre-Strain Dependent Strengthening Response During Paint Bake**
S. Jurendic, Z. Liang, R. Burrows (Novelis); S. Saha (RWTH Aachen)

- Improvement of Response Surface Quality for Full Car Frontal Crash Simulations by Suppressing Bifurcation using Statistical Approach**
M. Okamura (JSOL)

- Prediction of Residual Deformation from a Forming and Welding Procedure in Alloy 718 using LS-DYNA**
E. Odenberger, L. Pérez Caro (Swerea); M. Schill (DYNAmore Nordic)

- Experimental Investigation on the Damage Behavior of a Rubber-Toughened Polymer**
M. Helbig (DYNAmore)

- 16:30 **Experimental Investigation and Numerical Characterization of the Bake-Hardening Effect of a Two-Phase Steel**
D. Koch, A. Haufe (DYNAmore); M. Feucht (Daimler)

- Combined Analysis of LS-DYNA Crash-Simulations and Crash-Test Scans**
L. Jansen, D. Borsotto, C. Thole (Sidact)

- Preliminary Study on Modeling of the Deformation and Thermal Behavior of FSW using SPH Approach**
S. Patil, H. Lankarani (Wichita State University); F. Baratzadeh (National Institute for Aviation Research)

- Explicit and Implicit FE Simulations of Material Tests for Subsequent Durability Analyses**
P. Thumann, Prof. M. Wagner (OTH Regensburg); B. Suck (BMW Group); S. Marburg (TU München)

16:55 Break

CRASH – MODEL BUILDING

- Chair: T. Jost (VfF)
- 17:25 **Development of a 2015 Mid-Size Sedan Vehicle Model**
R. Reichert, S. Kan (George Mason University)

OCCUPANT SAFETY – CAE

- Chair: Prof. M. Boin (HS Ulm)
- Airbag Folding with JFOLD – Latest Developments and Case Studies**
R. Taylor (ARUP); S. Hayashi (JSOL)

IMPACT & FAILURE

- Chair: W. Chung (Theme Engineering)
- Numerical Modelling of the Fluid Structure Interaction using ALE and SPH: The Hydrodynamic Ram Phenomenon**
D. Varas, J. A. Artero-Guerrero, J. Pernas-Sánchez, J. López-Puente (University of Madrid)

EXPERIMENTS & PARAMETER OPT. – II

- Chair: P. Du Bois (Consultant)
- Testing in Support of the Development of Accurate Numerical Simulations of Plastic Deformation and Failure**
A. Gilat, J. Seidt (The Ohio State University)

- 17:50 **Small Electric Car Front Cross-Member Assembly Low Speed Impact Simulation**
Prof. G. Lampeas, I. Diamantakos, K. Fotopoulos (University of Patras); I. Lopez Benito (Batz S.)

- Curve Comparison using esiCORA**
M. Sommer, M. Seshadri (ESI)

- Novel Simulation of Composite Material behavior Subjected to Hyper-Velocity Impact (HVI) and Produced Secondary Debris by using Smoothed Particle Hydrodynamics Code (SPH) Methodology in LS-DYNA**
E. Giannaros, Prof. A. Kotzakolios, S. Tsantzas, V. Kostopoulos (University of Patras); G. Campoli (ESA /ESTEC)

- Application of Digital Image Correlation to Material Parameter Identification using LS-OPT**
N. Stander (LSTC); K. Witowski, A. Haufe, M. Helbig, D. Koch, C. Ilg (DYNAmore)

18:15

- Isogeometric Models for Impact Analysis with LS-DYNA**
M. Montanari, N. Petrinic (University of Oxford); L. Li (LSTC)

19:00 RECEPTION IN THE EXHIBITION HALL

L 2 – Plenary P

20:00 GALA DINNER IN "EUROPA HALL"

L = Level



E. DeHoff
Honda R&D Americas



P. Steinhäuser
IWC Schaffhausen



D. Moncayo
Daimler



Prof. C. Glöggler
Daimler

L 3 – Room F

METALS UNDER BLAST LOAD

Chair: J. Lacambre (DYNAmore France)
Investigation on the Dynamic Behavior of AlgoTuf 400F Steel
G. Toussaint (Defence Research and Development Canada)

Absorbing Materials – Tests Versus Simulations
R. Ridky, M. Popovic (SVS FEM);
M. Drdlova (Výzkumný ústav stavebních hmot); O. Koutny (Bogges)

Numerical Modelling of the Plastic Deformation of Ti-6Al-4V Sheets Under Explosive Loading
D. Kakogiannis, F. Coghe, L. Rabet (Royal Military Academy)

ARMOR PENETRATION

Chair: A. Farahani (eta)
Numerical Investigations on Ricochet of a Spin-Stabilised Projectile on Armour Steel Plates
M. Seidl, T. Wolf, R. Nuesing (ISL)

Numerical and Experimental Investigation of Asymmetrical Contact between a Steel Plate and Armor-Piercing Projectiles
T. Fras (French-German Research Institute of Saint-Louis); P. Pawlowski (Polish Academy of Sciences)

Numerical Study of the High Velocity Impact Response of Vehicle Armor Combination Using LS DYNA
G. Başaran (FNSS Savunma Sistemleri)

L 4 – Room G

ICFD SOLVER & FSI – II

Chair: G. Laird (Predictive Engineering)
Review and Advances of Coupling Methods for the ICFD Solver in LS-DYNA
F. Del Pin, I. Çaldichoury, R. Paz (LSTC)

Applications of ICFD / SPH Solvers by LS-DYNA to Solve Water Splashing Impact to Automobile Body
G. Wang, E. DeHoff (Honda R&D Americas); F. Del Pin, I. Çaldichoury, E. Yreux (LSTC); K. Gardner (Ohio State University)

Hydrodynamic Drag Force Predictions for Amphibious Military Vehicles
I. Kurtoglu (FNSS Savunma Sistemleri)

ICFD SOLVER & FSI – III

Chair: I. Çaldichoury (LSTC)
Applications of ICFD Solver by LS-DYNA in Automotive Fields to Solve Fluid-Solid-Interaction (FSI) Problems
G. Wang, P. Rodriguez, J. Tippie, S. Smith (Honda R&D Americas); F. Del Pin, I. Çaldichoury (LSTC)

Simulation of Flow Induced Vibrations in Pipes using the LS-DYNA ICFD Solver
M. Timgren (DYNAmore Nordic)

Free Fall Movement Decomposition of a Payload Released by Aircraft: Study of the Aerodynamic Coefficients using the LS-DYNA ICFD Solver
E. Grippon, M. Seulin, V. Lapoujade, T. Maillot, C. Michel (DynaS+)

L 2 – Room E

MODEL ORDER REDUCTION

Chair: D. Weigert (Audi)
An Investigation into Modeling Approaches for the Dynamic Response of a Shipping Container Cart and Suspended Automotive Parts under Random Base Excitation using LS-DYNA
Prof. S. Noll, A. Ramanathan (Ohio State University); E. DeHoff, R. Rittenhouse (Honda R&D Americas)

Application of Model Order Reduction Techniques in LS-DYNA
P. Friedrich, M. Thiele (SCALE); D. Weigert (Audi); U. Reuter (TU Dresden)

Hierarchical Multi-Level-Optimization of Crashworthy Structures using Automatic Generated Submodels
H. Singh, Prof. A. Schumacher (Bergische Universität Wuppertal); C. Falconi, A. Walser (Automotive Simulation Center Stuttgart); S. Trentmann, L. Benito (Iges. Für numerische Simulation); H. Müllerschön (Scale); C. Foussette, P. Krause (divis intelligent solutions)

ROAD SAFETY

Chair: R. Venkatesan (Kaizenat)
TB11 Test for Short W-Beam Road Barrier
K. Wilde, S. Burzyński, D. Bruski, J. Chróścielewski, W. Witkowski (Gdańsk University of Technology)

Simulation of Wire Rope Road Barriers and Vehicle Collision: Experiment and LS-DYNA Correlation
I. Karpov, I. Demiyanyushko, B. Tavshavadze (Moscow Automobile and Road Construction State Technical University (MADI))

On the Influence of Shell Element Properties on the Response of Car Model in Crash Test
S. Burzyński, K. Wilde, D. Bruski, J. Chróścielewski, W. Witkowski (Gdańsk University of Technology)

L 5 – Room H

WORKSHOP

Introduction into the New Optimization Tools for Forming Simulation with eta/DYNAFORM
M. Merten (DYNAmore)

Recently, DYNAFORM version 5.9.3 was published, which contains several new features. Particular highlights are the new automatic springback compensation process or the reworked blank & trim line development, which improve the workflow of a toolmaker in daily life.

The goal of this workshop is to present these new features and how they work. How they can be applied will be shown with the aid of a live demonstration on a simple geometry. Attention is drawn on a quick and proper setup for these processes.

WORKSHOP

Mapping with ENVYO
C. Liebold (DYNAmore)

ENVYO is a multi-purpose mapping tool which was introduced to the public in 2016 during the German LS-DYNA Forum

The goal of this workshop, is to present the already implemented mapping capabilities and to demonstrate their usage. The general need to map simulation results is shown with the aid of dedicated examples.

The workshop is closed with an open discussion where you can place your own ideas for future mapping developments.

15:40

16:05

16:30

16:55

17:25

17:50

18:15

19:00

20:00

L 0 – Room A

CRASH - BATTERIES & TIRES

Chair: J. Irslinger (Daimler)

08:30 **Mechanical Modeling of Li-Ion Cell Crush Experiments using LS-DYNA**
M. Seulin, C. Michel, V. Lapoujade (DynaS+); J. Marcicki (Ford Research and Innovation Center); P. L'Eplattenier (LSTC)

08:55 **Battery Abuse Simulations Using LS-DYNA**
 P. L'Eplattenier, S. Bateau-Meyer, I. Çaldichoury (LSTC)

09:20 **Modeling of a Cast Aluminum Wheel for Crash Application**
 Y. Leost (Fraunhofer EMI)

09:45 **Tire Model Development Update**
 S. Bala (LSTC)

10:10 Break

CRASH - CONNECTIONS

Chair: R. Reichert (George Mason Univ.)

10:40 **Modeling of Joints with Inserts for Sandwich Structures in Crash Simulation**
P. Rochel, S. Sommer (Fraunhofer IWM)

11:05 **Development of Accurate Finite Element Models and Testing Procedures for Bolted Joints in Large Caliber Gun Weapon Systems**
M. Koehler, G. Fish (US Navy)

11:30 **Characterization and Modeling of Spot-Weld Joints in Press Hardening Steels Associated with Softening in Heat Affected Zone**
H. Ghassemi-Armaki, Q. Khan (ArcelorMittal); A. Gill, S. Zilincik (Chrysler)

11:55 **Investigation of Undermatched Weld Fracture for Automotive Applications**
 B. Hiriyur, P. Woelke (Thornton Tomasetti)

12:20 Lunch break

L 2 – Plenary P

KEYNOTE PRESENTATIONS – FAREWELL

Chair: S. Bianco (Fiat); T. Münz (DYNAmore)

13:30 **Modelling of Adhesively Bonded Joints in CAE-Models at Porsche – Look behind the Scenes**
 F. Burbulla (Dr. Ing. h.c. F. Porsche)

14:00 **Recent Developments in LS-DYNA and LS-OPT – Part II**
 J. O. Hallquist, P. L'Eplattenier, N. Stander, Y. Huang, S. Bala, F. Del Pin (LSTC)

15:00 **Farewell**
 T. Münz (DYNAmore)

15:15 End of conference

L 0 – Room B

PEDESTRIAN SAFETY – HEAD IMPACT

Chair: A. Walser (ASCS)

Using LS-DYNA for Detailed Biomechanical Impact Simulation
W. Lietz, O. Siegemund (Cadferm); H. Ottersbach (IFA)

Head Impact Analysis Correlation for Aluminum Bonnet
O. Colpan, F. Aras (Tofas)

Validation of Thums Human Model Throw Distance in Pedestrian Accident Scenarios
M. Orłowski, C. Bastien, M. Bhagwani (Coventry University)

Define_Pressure_Tube: Simulating Pressure Tube Sensors in Pedestrian Crash
 J. Karlsson (DYNAmore Nordic)

L 0 – Room C

PARTICLE METHODS: SPH & DEM

Chair: Prof. P. Jonsen (Lulea University)

Impact of Soft Body Materials, an Experimental and Numerical Approach using a Hopkinson Tube: Application to Substitute Bird
J. Pernas-Sánchez, R. del Caurillo, J. A. Artero-Guerrero, D. Varas, J. López-Puente (University of Madrid)

Thermal Coupling Method between SPH Particles and Solid Elements in LS-DYNA
J. Xu, J. Wang (LSTC)

Simulation of Agricultural Soil Tillage Machine using DEM
H. Mouradjian, Z. Asaf, I. Shmulevich (Technion - Israel Institute of Technology); B. Zion (Israeli Agricultural Research Organization)

Discrete Element Modelling of a Metamaterial for Launcher Tanks Dynamic Experiments
T. Legaud, E. Gripon, V. Lapoujade, P. Chiambaretto (DynaS+)

L 1 – Room D

MATERIALS – SHORT FIBER

Chair: E. Michau (Faurecia)

Compression Molding Analysis of Long Fiber Reinforced Plastics using Coupled Method of Beam and 3D Adaptive EFG in LS-DYNA
S. Hayashi (JSOL); H. Chen, W. Hu (LSTC)

*MAT_4A_MICROMECH – Theory and Application Notes
P. Reithofer, A. Fertschej, B. Jilka (4a engineering); A. Erhart, S. Hartmann (DYNAmore)

High-Dynamic Drop Test Simulation for Fiber Reinforced Plastics in Automotive Electronic Control Units
T. Zhao, D. Papanthassiou (Bosch Automotive Products)

Considering the Local Anisotropy of Short Fiber Reinforced Plastics: Validation on Specimen and Component
R. Steinberger, T. Gross (Hirtenberger Automotive Group); S. Paul (Simpatec); P. Reithofer (4a engineering)

IMPLICIT MECHANICS

Chair: T. Erhart (DYNAmore)

Enhancements to Implicit Mechanics
R. Grimes, R. Lucas, C. Weisbecker, C. Ashcraft, F. H. Rouet, J. Anton (LSTC)

Improving LSTC's Multifrontal Linear Equation Solver
R. Lucas, R. Grimes, F. Rouet, C. Weisbecker (LSTC); N. Meng (Intel); T. Zhu (Cray)

An Implicit Study of High Order Elements in LS-DYNA
T. Borrvall (DYNAmore Nordic); Prof. D. Benson, H. Teng (LSTC)

A Roadmap to Linear and Nonlinear Implicit Analysis with LS-DYNA
 G. Laird (Predictive Engineering)

PROCESS – MISC.

Chair: T. Dutton (Dutton Simulation)

A Layer by Layer Approach for Simulating Residual Stresses in AM
N. Strömberg (Örebro University); M. Schill (DYNAmore Nordic)

Evaluation of Different Thermo-Viscoplastic Material Models under Simultaneous Hot/Cold Forging Conditions
M. Nahrman, P. Kühlmeier, Prof. A. Matzenmiller (University of Kassel)

Orbital Forming of SKF's Hub Bearing Units
E. Omerspahic, J. Facht (SKF)

Modelling of Hot Rotary Kiln
D. Ramanenka, G. Gustafsson, P. Jonsen (University of Lulea)

MATERIALS – LAMINATED GLAS

Chair: F. Andrade (DYNAmore)

Hybrid Laminated Glass: Material Characterization and CAE Modelling
 B. Feng (Jaguar Land Rover)

Validation Tests and Simulations for Laminated Safety Glass
M. Sauer, F. Kölbl (Fraunhofer EMI); K. Mattiasson (Chalmers University of Technology); L. Schmidt (Saint-Gobain Sekurit Deutschland); S. Wenig (Sika Automotive); T. Carlberger (University West); M. Buckley (Jaguar Land Rover)

A New Failure Criterion for Laminated Safety Glass
C. Alter, S. Kolling (TH Mittelhessen); J. Schneider (TU Darmstadt)

Laminated Amorphous Polymers Subjected to Low-Velocity Impact
A. Rühl, S. Kolling, J. Scheider (TH Mittelhessen); B. Kiesewetter (Evonik Industries)

L = Level

L 3 – Room F	L 4 – Room G	L 2 – Room E	L 5 – Room H	
MINE BLAST / CHEMISTRY COUPLING	SIMULATION – MISC. – I	IMPACT - MARINE & AVIATION	WORKSHOP	
Chair: O. Voikina (LLC Strela)	Chair: L Singh (Arup India)	Chair: Y.-G.Chung (Kostech)	LS-OPT Robustness Analysis K. Witowski (DYNAmore)	08:30
A Review of Structural Part Modelling for Blast Simulations G. Balaban, I. Kurtoglu (FNSS Savunma Sistemleri)	Finite Element Modelling of a NiTi SMA Wire W. L. H. Wan, A. Hamid, L. Iannucci (Imperial College London)	Marine Accident Integrated Analysis System using Highly Advanced M&S System of FSI Analysis Technique S.-G. Lee, J.-S. Lee, J.-H. Park, T.-Y. Jung (Korea Maritime & Ocean University)	The goal of this workshop is to provide an overview of the methods for robustness analysis that are available in LS-OPT. Herein, the basic ideas of direct and metamodel-based Monte Carlo Analysis as well as RBDO/RDO will be discussed.	08:55
Applying Buried Mine Blast Loads to a Structure Utilizing the User Module Capability E. Lazerson, H. Raz, Z. Asaf (Plasan SASA)	Process Chain Simulation for Die-Less-Hydroforming Including Welding and Forming using DynaWeld and LS-DYNA A. Metzger, T. Ummenhofer (Karlsruhe Institute of Technology)	Cause Investigation of Flooding & Sinking Accident of Ro-Ro Ferry Ship using Marine Accident Integrated Analysis System S.-G. Lee, J.-S. Lee, J.-H. Park, T.-Y. Jung (Korea Maritime & Ocean Univ.)	A life demonstration of how to set up a robustness analysis using the graphical user interface of LS-OPT and how to visualize and evaluate the results will also be given.	09:20
FSI with the Detailed Chemistry and their Applications in LS-DYNA CESE Compressible Solver I. Kyoung-Su, Z. Zhang, G. Cook, (LSTC)	Study on the Electromagnetic Flux Generation using the new 2D Axisymmetric Capability of Electromagnetism Solver in LS-DYNA K. Takekoshi (Terrabyte)	Cause Investigation of Capsizing Accident of Ro-Ro Ferry Ship using Marine Accident Integrated Analysis System S.-G. Lee, J.-S. Lee, J.-H. Park, T.-Y. Jung (Korea Maritime & Ocean Univ.)		09:45
	Control System in LS-DYNA C. Keisser (DYNAmore France); I. Yeh (LSTC)	Test and Simulation Approach Towards the Certification of an Aircraft Structure Subjected to a Bird Strike H. Abdulhamid, F. Plassard (Thiot-Ingenierie)		10:10
FAILURE – MISC.	SIMULATION – MISC. – II		WORKSHOP	
Chair: V. Lapoujade (DynaS+)	Chair: G. Marchaud (AREVA TN)		Blast Analysis with LS-DYNA D. Hilding (DYNAmore Nordic)	10:40
Numerical Modelling of Symmetric and Asymmetric Punching and Post-Punching Shear Responses of RC Flat Slab N. Ulaeto, J. Sagaseta (University of Surrey)	Characterization and Modeling of Engineering Friction and Wear with LS-DYNA S. Dong (Ohio State University); A. Sheldon (Honda R&D Americas)		An overview is given of the available methods in LS-DYNA to calculate explosive blast loads from conventional explosives on structures for structural engineering purposes. Advantages and disadvantages with the different methods will be pointed out. The focus is on air-blast.	11:05
Evaluation of Advanced Element Formulations for Failure Prediction of Highly Complex 3D-Printed Parts S. Mohapatra (Sabic Research & Technology Center)	Numerical Model to Predict Kickback for Angle Grinders G. Fleury (INRS)		The intended audience is LS-DYNA users interested in methods for blast & explosion simulation with the goal to be able to do strength/performance analysis of blast loaded structures. Time permitting, a short demonstration will be given.	11:30
Reduced Ductility due to Local Variation in Material Properties for 3D-printed Components T. Tryland (Sintef Raufoss Manufacturing)	Biotex BigBag Simulation - LS-DYNA Airbag Tool Unusual Application C. Weinberger, B. Hirschmann (4a engineering); J. Eichelter (Franz S. Huemer)			11:55
A 3D Discontinuous Galerkin Finite Element Method with the Bond-Based Peridynamics Model for Dynamic Brittle Failure Analysis W. Hu, B. Ren, C.T. Wu, Y. Guo, J. Wu (LSTC)	Verification and Validation of LS-DYNA for the Transport and Storage of Radioactive Materials G. Marchaud, V. Saint-Jean (Areva)			12:20



F. Burbulla
Dr. Ing. h.c. F. Porsche



P. L'Epattenier
LSTC



N. Stander
LSTC



Y. Huang
LSTC



S. Bala
LSTC



F. Del Pin
LSTC

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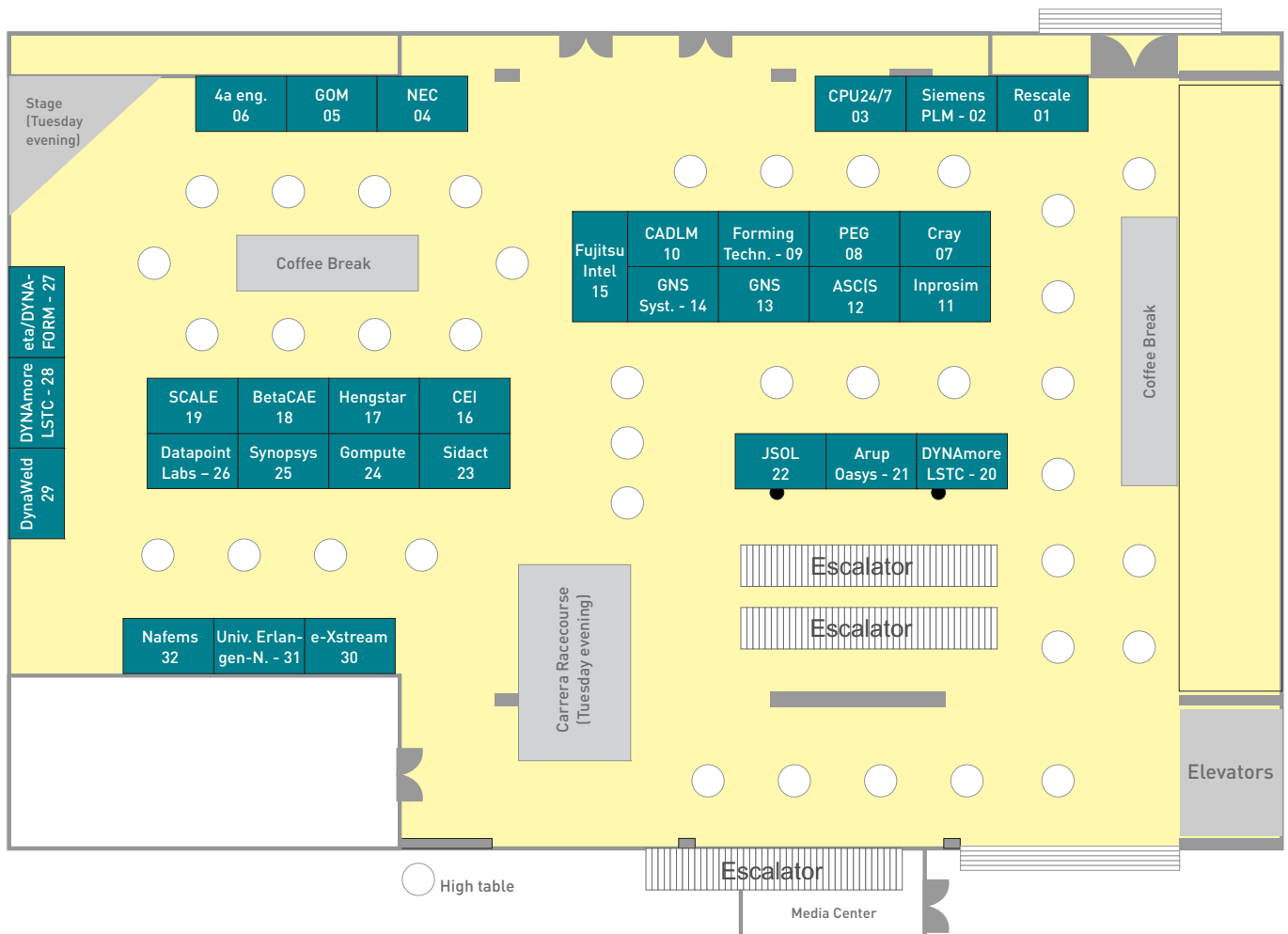
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