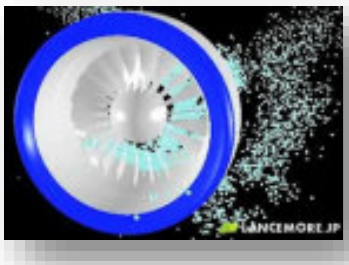
fea INFORMATION Engineering Solutions

LSTC Livermore Software Technology Corp.

Volume 7, Issue 04, April 2018

www.lstc.com http://dalianfukun.com www.feapublications.com

FEANTM



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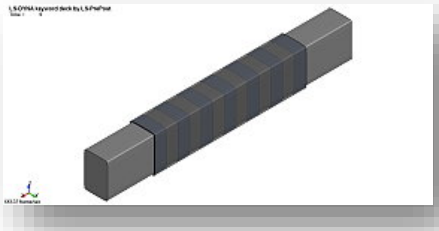


Predictive Engineering

Rescale

LS-DYNA New Features:

Introducing *BOUNDARY_SPC_SYMMETRY_PLANE (SET)

LS-DYNA's Linear Solver Development — Phase 1: Element Validation

FEA Engineering Solutions

www.feapublications.com

The focus is engineering technical solutions/information.

FEA Information China Engineering Solutions

Simplified and Traditional Chinese

The focus is engineering technical solutions/information.

Editor and Contact: Yanhua - yanhua@feainformation.com

Platinum Particpants

Platinum Particpants

BETA SIMULATION SOLUTIONS

MSC Materials Sciences Corporation

eta

esi get it right

JSOL

恒士达科技 Hengstar Tech.

Oasys The Software House of Arup

rescale

Finite Element Analysis Predictive Engineering

[FEA Not To Miss]

Table of contents

Announcements

The Pre and Post classes have all been confirmed to take place at the 15th International LS-DYNA Conference.

www.ls-dynaconferences.com

FEA Participants at the 15th International LS-DYNA Conference booth(s)

100	ETA	www.eta.com
101	Oasys	www.oasys-software.com/dyna/en /
103	DatapontLabs	www.datapointlabs.com/
105	Rescale	www.rescale.com
107	JSOL	www.jsol.co.jp/english/cae
201	BETA Simulation Solutions	www.beta-cae.com /
301	Predictive Engineering	www.predictiveengineering.com
303	Shanghai Hengstar Technology	www.hengstar.com
305	ESI Group	www.esi-group.com
400	DYNAmore GmbH & LSTC	www.lstc.com
401	FEA Information D3View Dalian Fukun	www.feainformation.com www.d3view.com www.dalianfukun.com/

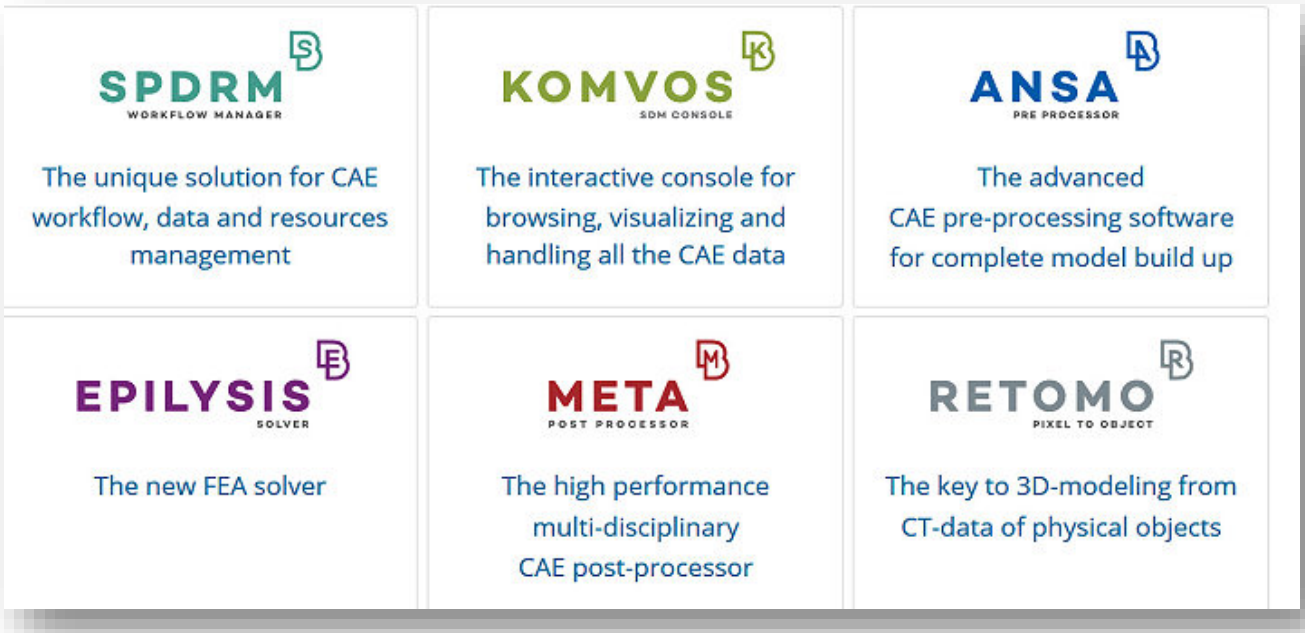
If you have any questions, suggestions or recommended changes, please let us know.

Contact: Marsha mv@feainformation.com

BETA CAE Systems

www.beta-cae.com

Developing CAE software systems for all simulation disciplines. Products: ANSA pre-processor/ EPILYSIS solver and META post-processor suite, and SPDRM, the simulation-process-data-and-resources manager, for a range of industries, incl. the automotive, railway vehicles, aerospace, motorsports, chemical processes engineering, energy, electronics…



2018 Open Meeting in Korea	**2018 Open Meeting in Italy**	**Flex Body Simulation with ANSA KINETICS**
May 10, 2018	**May 15, 2018**	**Tutorial for flexible multibody dynamics simulation process setup, in 5 parts. YouTube**
InterContinental Seoul COEX	**AC Hotel By Marriott Torino**	

d3VIEW is a data to decision platform that provides out-of-the box data extraction, transformation and interactive visualizations. Using d3VIEW, you can visualize, mine and analyze the data quickly to enable faster and better decisions.

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Using d3VIEW, you can visualize, mine and analyze the data quickly to enable faster and better decisions.

Overview - d3View can integrate with any High Performance Computing (HPC) systems to submit and track jobs, perform complex data transformations using a rich library of templates that can help turn data to information, help visualize thousands of data using rich powerful visualizations, export to reports to share and collaborate.

HPC Interactions - Using the HPC application, you can submit and track simulation or non-simulation jobs that require compute resources…

Visualize your Data - View your data using extensive library of visualizations to understand your information and to help you make decisions quickly….

Introducing Peacock beta - View your 3D data using our native Multi-threaded GPU-Powered Visualizer….

Track Key Performance Targets and Indexes
Define and track key performance targets across simulations and tests to help you identify your design performance…

Design of Experiments (DOE) Data Visualizer - Viewing data from your DOE runs can be challenging when running simulations on the cloud or on-premise HPC system..

Experimental Data - d3VIEW's data to decision framework supports storing, organizing and visualization of experimental data…

Author: Christian Frech christian.frech@dynamore.de Contact: forum@dynamore.de

Announcement and Call for Papers

15th German LS-DYNA Forum 2018
October 15 - 17 2018, Bamberg, Germany
www.dynamore.de/forum2018-e

Call for Papers
DYNAmore kindly invites you to participate at the 15th German LS-DYNA® Forum 2018 and encourages you to actively contribute to the conference agenda by submitting a presentation about your experience with the LSTC product range. Participation without a presentation is also worth-while to exchange your knowledge and discuss new solution approaches with other users. Besides presentations from users, there will be also selected keynote lectures of renowned speakers from industry and universities as well as developer presentations from LSTC and DYNAmore. The popular workshops on various topics will also be continued.

We hope that we have stimulated your interest and are looking forward to receiving your abstract and to seeing you in Bamberg.

Attending
In user presentations from industry and academia you will learn more about the software packages LS-DYNA®, LS-OPT®, LS-TaSC™ and LS-PrePost®, as well as their application possibilities for virtual product design.

Presenting
Communicate your work with international colleagues to share knowledge and to stimulate discussions with other users about new solution approaches.

Exhibiting and sponsoring
If you want to contribute, please request additional exhibitor and sponsoring information.

Venue
Welcome Kongresshotel Bamberg
Mußstraße 7, 96047 Bamberg, Germany
www.welcome-hotels.com/welcome-kongresshotel-bamberg

Conference languages
German and English

Contact
DYNAmore GmbH
Industriestr. 2, D-70565 Stuttgart, Germany
Tel. +49 (0) 7 11 - 45 96 00 - 0
E-Mail: conference@dynamore.de
www.dynamore.de

A leading innovator in Virtual Prototyping software and services. Specialist in material physics, ESI has developed a unique proficiency in helping industrial manufacturers replace physical prototypes by virtual prototypes, allowing them to virtually manufacture, assemble, test and pre-certify their future products.

Virtual Prototyping helps Gazelle Tech Develop an Innovative Vehicle that Reduces Energy Consumption by Half

"ESI Virtual Performance Solution saves us time and money. We are able to validate the performance of our innovative composite vehicle virtually before even manufacturing the first real prototype." Gaël LAVAUD, CEO -

Challenge - With the car market expected to double in the next 20 years, and fossil fuels becoming scarcer, disruptive and innovative green, light cars must be developed. Developing these types of vehicles, which can be produced close to the ultimate customer, presents an interesting opportunity to reduce the total CO2 footprint. With cutting-edge technology, that is exactly what Gazelle Tech is working to do to decrease our carbon footprint yet still offer mobility to all

Story - Gazelle Tech, a French startup company created in 2014, is the first peri-urban composite vehicle manufacturer of its kind. Their vehicle is currently under development and the industrial version is expected to be released in 2018. It features a composite chassis and body technology that makes it one third the weight of its competition and reduces energy consumption by half. The model will be offered in both gas and electric versions for a B2B market in France, as well as emerging countries in Africa and Asia.

Benefits - Gazelle Tech is developing a new production method for an innovative, low carbon impact vehicle, with the objective of offering sustainable transportation to all. Using ESI Virtual Performance Solution, they're able to:

- Reduce time to market by eliminating physical prototypes
- Ensure a safe, lightweight vehicle design
- Realize the necessary design adjustments for an overall optimal design

ETA has impacted the design and development of numerous products - autos, trains, aircraft, household appliances, and consumer electronics. By enabling engineers to simulate the behavior of these products during manufacture or during their use, ETA has been involved in making these products safer, more durable, lighter weight, and less expensive to develop.

Inventium Suite - From Concept to Product.

The Inventium Suite is an enterprise-level CAE software solution.

Inventium offers a streamlined product architecture which provides users access to all of the suite's software tools. By design it offers a high performance modeling and post-processing system, while providing a robust path for the integration of new tools and third party applications.

PreSys - Works the Way You Do

Inventium's Core FE Modeling Toolset, PreSys is the successor to ETA's VPG/PrePost and FEMB products. PreSys offers an easy to use interface, with drop-down menus and toolbars, increased graphics speed and detailed graphics capabilities. These types of capabilities are combined with powerful, robust and accurate modeling functions.

VPG - Analyze Mechanical Systems Accurately

VPG delivers a unique set of tools which allow engineers to create and visualize, through its modules--structure, safety, drop test, and blast analyses.

DYNAFORM - Complete Die System Simulation Solution

The most accurate die analysis solution available today. Its formability simulation creates a "virtual tryout", predicting forming problems such as cracking, wrinkling, thinning and spring-back before any physical tooling is produced.

NISA - Solving Engineering Challenges

NISA is a robust & comprehensive Finite Element Analysis (FEA) software toolset for engineering analysis. For over three decades scientists, engineers & researchers have come to depend on NISA to solve their most complex engineering problems. It can be used on its own or with PreSys

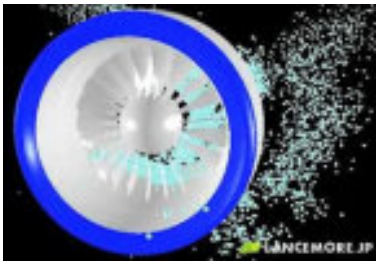
www.eta.com/training
Training DYNAFORM
May 16 & 17
June 20 & 21
ETA Technology Summit
June 13
15th Int'l LS-DYNA Conference
June 10 - 12 Booth 100

FEA Not To Miss, is a weekly internet blog on helpful videos, tutorials and other Not To Miss important internet postings. Plus, a monthly email blog.

Welcome to Monday - grab a cup of coffee, tea or protein drink and join me for FEA Not To Miss Monday

Postings every Monday on what you have missed

www.feantm.com



03/26/2018

Hi Everyone, let's grab coffee and feed the birds in the park. Fly birdie, fly - NO, not into a plane fan blade! Oh gross! I am glad it is not real birds in the simulations.

LS-DYNA Sample Model No.032 Bird Strike

OUCH AGAIN! Poor Birds!!!

bird strike on turbojet

This is a well known classics of SPH simulation - done with LS-DYNA

We all agree - BIG OUCH on heads! So, to see how football helments are getting safer, grab that coffee and lets "head" for a touchdown over at YouTube and don't drop that football!

Hengstar Technology

www.hengstar.com

Shanghai Hengstar Technology sells and supports LSTC's suite of products and other software solutions. These provide the Chinese automotive industry a simulation environment designed and ready multidisciplinary engineering needs. Sales, Consulting, Training & Support.

Hongsheng Lu welcomes you to Shanghai Hengstar Technology

Distributor in China, for FEA and CAE needs for engineers, professors, students, consultants.

Contact us for our LS-DYNA training courses, such as

- Crashworthiness Simulation with LS-DYNA
- Restraint System Design with Using LS-DYNA
- LS-DYNA MPP
- Airbag Simulation with CPM
- LS-OPT with LS-DYNA

Our classes are given by experts from LSTC USA, domestic OEMs, Germany, Japan, etc. These courses help CAE engineers to effectively use CAE tools such as LS-DYNA to improve car safety and quality, and therefore to enhance the capability of product design and innovation.

Sales & Consulting - Besides solver specific software sales, distribution and support activities, Shanghai Hengstar offers associated training and consulting services to the Chinese automotive market since April 1st, 2013

Solutions - Our software solutions provide the Chinese automotive industry, educational institutions, and other companies a mature suite of tools - powerful and expandable simulation environment designed and ready for future multidisciplinary CAE engineering needs.

Shanghai Hengstar provides engineering services, consulting and training that combine analysis and simulation using Finite Element Methods such as LS-DYNA.

hongsheng@hengstar.com
Shanghai Hengstar Technology Co., Ltd
http://www.hengstar.com

Shanghai Enhu Technology Co., Ltd
http://www.enhu.com

JSOL supports industries with the simulation technology of state-of-the-art. Supporting customers with providing a variety of solutions from software development to technical support, consulting, in CAE (Computer Aided Engineering) field. Sales, Support, Training.

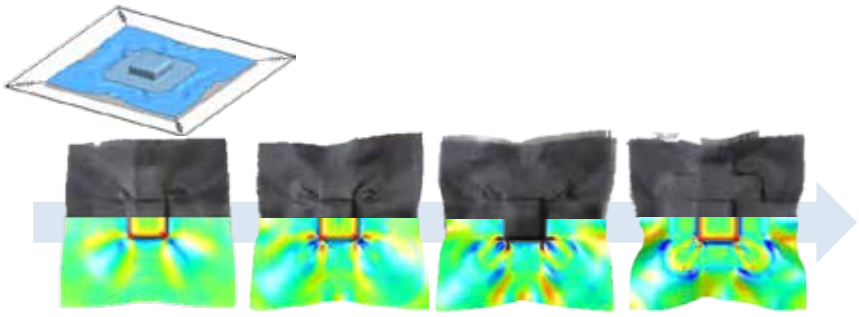
For Article and higher resolution **Contact; cae-info@sci.jsol.co.jp**

J-Composites - New tool series for process and process-chain simulations of composite materials

JSOL Corporation, a Japanese LS-DYNA distributor, released the J-Composites series. A series of new software tools to help LS-DYNA users easily conduct process/process-chain simulations of fiber reinforced composites.

Fiber reinforced composites are good alternatives for metals used in load transmission structures. The increasing requirement for high performance and weight reduction in industry has gradually expanded the use of composites. Finite element analysis as an alternative approach for experimental study is effective in designing fiber reinforced composite products because there are many design parameters. Process/process-chain simulations are especially important because the performance of the final composite part strongly depends on changes in fiber orientation during the process. In this context, JSOL is developing the J-Composites series. A series of new software tools to help LS-DYNA users easily conduct process/process-chain simulations of fiber reinforced composites.

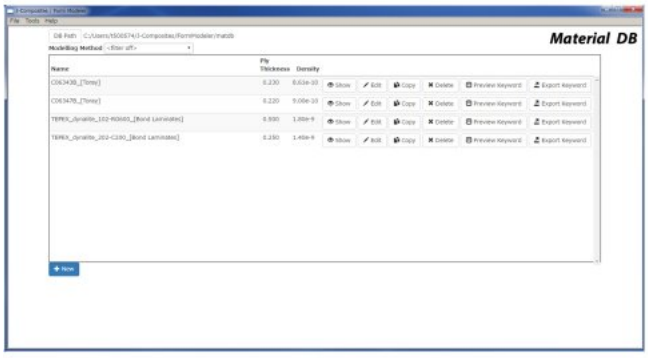
The first software tool, called J-Composites/Form Modeler, was released in August 2017, in Japan. This tool is for creating FE models for continuous fiber reinforced composite forming simulation. Users can create models that, when used with LS-DYNA, will accurately predict the macroscopic forming behavior of laminate plies made of dry fabric and thermoplastic/thermoset pre-pregs. Through simulation, this tool can help the user detect forming defects like wrinkling, fiber bridging and rupture, which leads to reduced development time and cost.



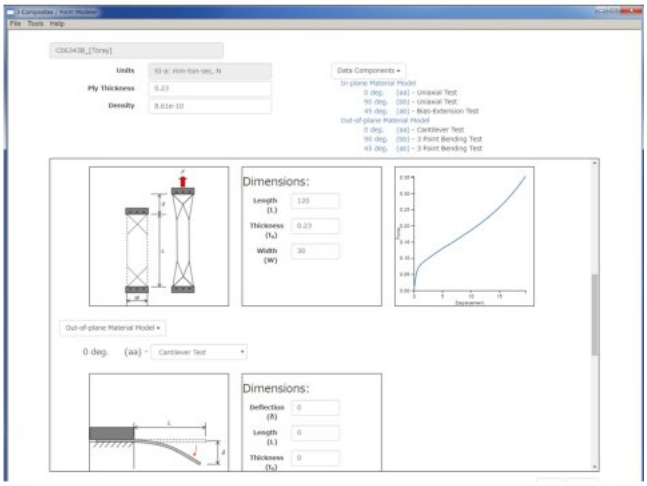
Accurate prediction of wrinkle development (Carbon fiber fabric)

The key features of Form Modeler are easy build-up of material models with automatic parameter identification based on material testing results, efficient setup of laminate modeling with the easy-to-use UI, and the mapping of forming information to crash simulation models.

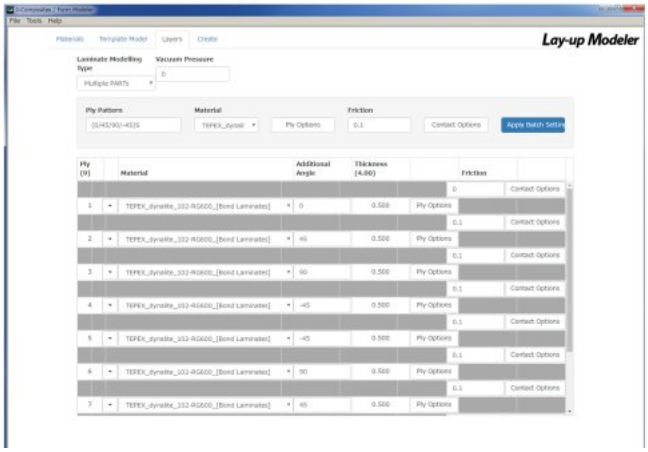
Standard material database included



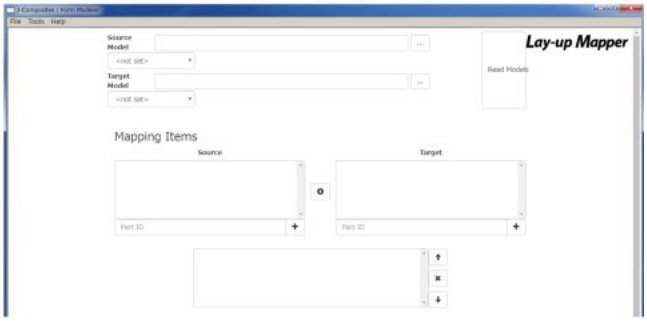
Material parameter identification



Setup laminate composition



Forming information mapping to crash model



Main functions of Form Modeler

Contact; JSOL Corporation, Engineering Technology Division, cae-info@sci.jsol.co.jp

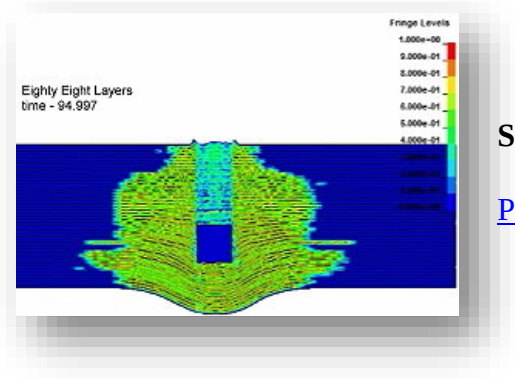
A team of engineers, mathematicians, & computer scientists develop LS-DYNA, LS-PrePost, LS-OPT, LS-TaSC, and LSTC's Dummy & Barrier models.

15th LS-DYNA® International Conference & Users Meeting

Booth Number	Sponsoring	Exhibitors and Sponsors
100	**Booth & Conference Bag**	**ETA**
101	**Booth & Mon. Lunch**	**ARUP**
102	Booth	Humanetics
103	Booth	DataPointLabs
104	Booth	CDH
105	Booth	Rescale
107	Booth	JSOL
200	Booth	Vanderplaats R & D, Inc
201	**Booth & Tues. AM Break**	**BETA CAE Systems USA Inc.**
202	**Banquet**	**ANSYS Inc.**
203	Booth	Moldex3d
205	Booth	e-Xstream
206	**Booth & Mon. PM Break**	**TOTAL CAE**
300	Booth	Gompute
301	Booth	Predictive Engineering
302	Booth	OSU/SimCenter
303	**Booth & Tues. PM Break**	**Shanghai Hengstar**
305	**Booth**	ESI Group
307	Booth	GFAI & Franhaufer IWM
401	**Booth & Reception**	**FEA Information Inc.**
403	Booth	Penguin Computing
404	Booth	Forming Technologies Inc.
406	Booth	Detroit Engineered Products

Providing engineering services to the composites industry since 1970. During this time, we have participated in numerous programs that demonstrate our ability to: perform advanced composite design, analysis and testing; provide overall program management; work in a team environment; and transition new product development to the military and commercial sectors.

MAT162 is a material model for use in LS-DYNA that may be used to simulate the onset and progression of damage in unidirectional and orthotropic fabric composite continua due to 3D stress fields. This failure model can be used to effectively simulate fiber dominated failures, matrix damage, and includes a stress-based delamination failure criterion. This approach to predicting interlaminar failure is advantageous in cases when locations of delamination sites (i.e., interlaminar crack initiation surfaces) cannot be anticipated.

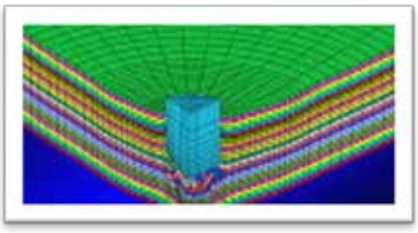


Simulation Movie

Penetration and Perforation of Moderately Thick Composites

Examples are located at www.ccm.udel.edu/software/mat162/examples /

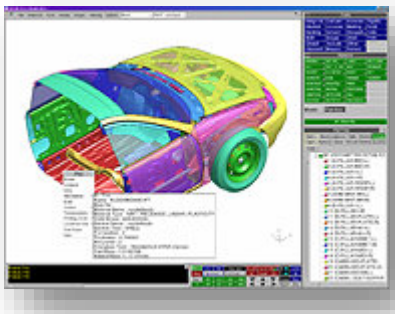
Example 1:
Sphere Impact on a Composite Laminate
Example 2:
Sphere Impact on a Perfectly Clamped Composite Plate
Example 3:
Sphere Impact on Elliptical Carbon/Epoxy Tube



High Velocity Impact of Square Plate using MAT161/162

www.youtube.com/watch?v=NgjncjfLKGw

Oasys Ltd is the software house of Arup and distributor of the LS-DYNA software in the UK, India and China. We develop the Oasys Suite of pre- and post-processing software for use with LS-DYNA.



Oasys PRIMER: The Oasys PRIMER pre-processor is designed to make preparation and modification of LS-DYNA models as fast and as simple as possible, improving user productivity and efficiency and reducing the time spent manipulating and developing models suitable for LS-DYNA.

Our priority with Oasys PRIMER is to provide complete support for every LS-DYNA keyword. The user can be assured that every model read in and written out will lose no data.

Main features:

- Full support for LS-DYNA version R9.0
- Connections function for defining various connections (e.g. spotwelds, bolts) including a Autoweld function that does not require an input file
- Quick-pick menu for on-screen manipulation of entity display characteristics
- Quick-pick menu for on-screen editing of LS-DYNA keywords
- Easy access to part data through the Part Tree navigation menu, and Part Table
- Cross reference viewer menu for tracking how different entities refer to each other
- Airbag Folding including mesh-independent airbag folding
- Seatbelt fitting including automatic seatbelt re-fitting after dummy re-positioning
- Mechanisms
- Keyboard shortcut keys for most of the common functions
- Simple meshing capability.
- Full support for LS-DYNA parameters
- Background image and image/model alignment function

Oasys PRIMER is designed specifically for pre-processing with LS-DYNA. Therefore the user interface is clear, simple and tailored towards LS-DYNA - without any compromises. All of the common keywords can be created, modified and graphically visualised to help users understand exactly what a model contains and how the various entities are inter-related.

Full Information: Oasys PRIMER

Predictive Engineering provides finite element analysis consulting services, software, training and support to a broad range of engineering companies across North America. We strive to exceed client expectations for accuracy, timeliness and knowledge transfer. Our process is both cost-effective and collaborative, ensuring all clients are reference clients.

Combat Ships Roll Off Assembly Line for Austal USA

Blog Appplied CAx -

Littoral Combat Ships are rolling off the assembly line for our FEMAP customer, Austal USA. Austal has delivered seven Independence-variant LCS ships to the US Navy.

The 7th ship – the future Manchester (LCS 14) - will leave Austal's Alabama shipyard soon and cruise up to New England for commissioning before heading west for duty out of San Diego.

"We're so excited to deliver another LCS to the fleet," Austal USA president Craig Perciavalle said in a prepared statement. "The efficiency at which we're delivering these ships is world class, and a testament to the incredible skill and hard work of the best shipbuilding professionals in the country."

The eighth Independence-variant LCS, Tulsa (LCS 16), recently completed acceptance trials in the Gulf of Mexico.

The Tulsa has a draft of 14', a marine crew of 40, a total crew of 110 and displaces 2,675 metric tons. Main propulsion comes from twin GE LM2500 gas turbine engines, producing 29,500 hp, and two MTU 20V8000 diesel engines, putting out 12,200 hp total.

The five remaining LCS's under construction at Austal's Alabama shipyard include Charleston (LCS 18), Cincinnati (LCS 20), Kansas City (LCS 22), Oakland (LCS 24) and the future USS Mobile (LCS 26)

Offering industry-leading software platforms and hardware infrastructure for companies to perform scientific and engineering simulations. Providing simulation platforms that empower engineers, scientists, developers, and CIO and IT professionals to design innovative products, develop robust applications, and transform IT into unified, agile environments.

Excerpt - full article can be read on www.rescale.com

Cloud HPC Simulation Enables Boom's Supersonic Passenger Jet to Take Off

Boom's supersonic demonstrator, the XB-1, was simulated entirely on Rescale's platform for cloud HPC.

Background and Challenge Boom Supersonic is an aerospace startup that is redefining passenger air travel. They are designing a supersonic passenger jet that will take business travelers from San Francisco to Tokyo in 5.5 hours, revolutionizing business travel and revitalizing a long stagnant industry. Only a few years old, they are already backed by significant funding and have secured over 75 advance orders from airlines around the world.

Boom's innovation comes more than 40 years after the introduction of the Concorde, an engineering marvel but an economic disappointment. Many years later, using cutting-edge simulation combined with cloud technology, Boom is setting out to accomplish what Concorde could not: a sustainable business model. Creating a technological breakthrough is not easy in the aerospace sector. It traditionally requires billions of dollars in R&D, a small army of engineering staff, extensive wind tunnel testing, and many years of development. More recently, advanced fluid-flow and mechanical stress simulation tools have reduced physical testing requirements and costs, but they require costly dedicated high performance computing (HPC) resources to be effective.

As a small startup with limited funding but outsized dreams, Boom turned to the public cloud because the upfront costs of building their own on-premise HPC cluster were cost-prohibitive. The company briefly considered developing their own software infrastructure and middleware for spinning up compute clusters on the public cloud on-demand, but the IT and software development resources required for that, too, were costprohibitive.

Needing immediate burst capability and pay-as-you-go compute clusters without the time and expense of setting up their own software and hardware infrastructure, Boom has run all their simulations on Rescale's enterprise big compute platform since day one. Rescale offers Boom virtually unlimited compute capacity, while allowing them to bypass investment in internal IT capability—both incredibly valuable to an early stage startup with limited funding. In essence, Rescale enables Boom—and their technology—to get off the ground.

CAE software sale & customer support , initial launch-up support, periodic on-site support. Engineering Services. Timely solutions, rapid problem set up, expert analysis . material property test Tension test, compression test, high-speed tension test and viscoelasticitiy test for plastic, rubber or foam materials. We verify the material property by LS-DYNA calculations before delivery.

www.feapublications.com - Our January issue highlighted:
Impact Analysis of Reinforced Concrete Walls Using LS-DYNA: Application to Impact of Wind-Blown Vehicles due to Tornadoes, **M. Madurapperuma & K. Niwa - Terrabyte Corporation**

For the entire list of products, within each category, please visit Terrabyte Website

FE analysis

- LS-DYNA is a general-purpose FE program capable of simulating complex real world problems. It is used by the automobile, aerospace, construction, military, manufacturing and bioengineering industries.
- ACS SASSI is a state-of-the-art highly specialized finite element computer code for performing 3D nonlinear soil-structure interaction analyses for shallow, embedded, deeply embedded and buried structures under coherent and incoherent earthquake ground motions.

CFD analysis

- AMI CFD software calculates aerodynamics, hydrodynamics, propulsion and aero elasticity which covers from concept design stage of aerocraft to detailed design, test flight and accident analysis.

EM analysis

- JMAG is a comprehensive software suite for electromechanical equipment design and development. Powerful simulation and analysis technologies provide a new standard in performance and quality for product design.

Metal sheet

- JSTAMP is an integrated forming simulation system for virtual tool shop based on IT environment. JSTAMP is widely used in many companies, mainly automobile companies and suppliers, electronics, and steel/iron companies in Japan.

Pre/ Post

- **PreSys** is an engineering simulation solution for FE model development. It offers an intuitive user interface with many streamlined functions, allowing fewer operation steps with a minimum amount of data entry.
- **JVISION** - Multipurpose pre/post-processor for FE solver. It has tight interface with LS-DYNA. Users can obtain both load reduction for analysis work and model quality improvements.

Biomechanics

- **The AnyBody Modeling System**™ is a software system for simulating the mechanics of the live human body working in concert with its environment.

Simulation of Torsional behavior of RC beams strengthened with PBO-FRCM composite

LS-DYNA is being used to examine the torsional behavior of RC beam strengthened with PBO-FRCM. Solid rectangular RC beam were externally strengthened with (PBO-FRCM) composite material in different wrapping configurations to investigate the torsional behavior in terms of strength, rotational ductility, and failure mode. Increases in the torsional strength, and corresponding values of twist were achieved by beams strengthened with a 4-sided wrapping configuration relative to the control (un-strengthened) beam. The contribution of the strengthening system to the torsional strength was reasonably predicted (±20%) by the strain measured in the composite fibers.

Some of the Important Cards Used (LS-DYNA):

*CONSTRAINED_BEAM_IN_SOLID
* CONSTRAINED_ SHELL _IN_SOLID
*MAT_ENHANCHED_COMPOSITE_DAMAGE (*MAT_54)
*MAT_WINFRITH_CONCRETE (*MAT_084/085)
*CONTACT_TIED_SURFACE_TO_SURFACE_OFFSET

Figure: Torsional behavior of RC beam strengthened with PBO-FRCM composite.
To know more about the simulation, please contact support@kaizenat.com

China FEA News Participants

www.eta.com

www.flotrend.com.tw

恒士达科技 Hengstar Tech.

www.hengstar.com

Dynawe

www.dynawe.com

ARUP

www.oasys-software.com/dyna

AgileSim

www.agilesim.com.tw

PAN-i

www.pan-i.com

DLFK

http://dalianfukun.com

FEA Information China - For Sign Up or to offer Articles Contact:
Editors: Yanhua Zhao - Yanhua@feainformation.com

BETA
SIMULATION SOLUTIONS

BETA CAE Systems. **www.beta-cae.com**

BETA CAE Systems - ANSA

An advanced multidisciplinary CAE pre-processing tool that provides all the necessary functionality for full-model build up, from CAD data to ready-to-run solver input file, in a single integrated environment. ANSA is a full product modeler for LS-DYNA, with integrated Data Management and Process Automation. ANSA can also be directly coupled with LS-OPT of LSTC to provide an integrated solution in the field of optimization.

BETA CAE Systems μETA

Is a multi-purpose post-processor meeting diverging needs from various CAE disciplines. It owes its success to its impressive performance, innovative features and capabilities of interaction between animations, plots, videos, reports and other objects. It offers extensive support and handling of LS-DYNA 2D and 3D results, including those compressed with SCAI's FEMZIP software

Solutions for:

Process Automation - Data Management – Meshing – Durability - Crash & Safety NVH - CFD - Thermal analysis - Optimization - Powertrain
Products made of composite materials - Analysis Tools -
Maritime and Offshore Design - Aerospace engineering - Biomechanics

DatapointLabs **www.datapointlabs.com**

Testing over 1000 materials per year for a wide range of physical properties, DatapointLabs is a center of excellence providing global support to industries engaged in new product development and R&D.

The compary meets the material property needs of CAE/FEA analysts, with a specialized product line, TestPaks®, which allow CAE analysts to easily order material testing for the calibration of over 100 different material models.

DatapointLabs maintains a world-class testing facility with expertise in physical properties of plastics, rubber, food, ceramics, and metals.

Core competencies include mechanical, thermal and flow properties of materials with a focus on precision properties for use in product development and R&D.

Engineering Design Data including material model calibrations for CAE Research Support Services, your personal expert testing laboratory Lab Facilities gives you a glimpse of our extensive test facilities Test Catalog gets you instant quotes for over 200 physical properties.

ETA – Engineering Technology Associates **www.eta.com**

etainfo@eta.com

Inventium Suite™

Inventium Suite™ is an enterprise-level CAE software solution, enabling concept to product. Inventium's first set of tools will be released soon, in the form of an advanced Pre & Post processor, called PreSys.

Inventium's unified and streamlined product architecture will provide users access to all of the suite's software tools. By design, its products will offer a high performance modeling and post-processing system, while providing a robust path for the integration of new tools and third party applications.

PreSys

Inventium's core FE modeling toolset. It is the successor to ETA's VPG/PrePost and FEMB products. PreSys offers an easy to use interface, with drop-down menus and toolbars, increased graphics speed and detailed graphics capabilities. These types of capabilities are combined with powerful, robust and accurate modeling functions.

VPG

Advanced systems analysis package. VPG delivers a unique set of tools which allow engineers to create and visualize, through its modules--structure, safety, drop test, and blast analyses.

DYNAFORM

Complete Die System Simulation Solution. The most accurate die analysis solution available today. Its formability simulation creates a "virtual tryout", predicting forming problems such as cracking, wrinkling, thinning and spring-back before any physical tooling is produced

get it right®

Latest Release is ESI Visual-Environment 12.0

ESI Group **www.esi-group.com**

Visual-Environment is an integrative simulation platform for simulation tools operating either concurrently or standalone for various solver. Comprehensive and integrated solutions for meshing, pre/post processing, process automation and simulation data management are available within same environment enabling seamless execution and automation of tedious workflows. This very open and versatile environment simplifies the work of CAE engineers across the enterprise by facilitating collaboration and data sharing leading to increase of productivity.

Visual-Crash DYNA provides advanced preprocessing functionality for LS-DYNA users, e.g. fast iteration and rapid model revision processes, from data input to visualization for crashworthiness simulation and design. It ensures quick model browsing, advanced mesh editing capabilities and rapid graphical assembly of system models. Visual-Crash DYNA allows graphical creation, modification and deletion of LS-DYNA entities. It comprises tools for checking model quality and simulation parameters prior to launching calculations with the solver. These tools help in correcting errors and fine-tuning the model and simulation before submitting it to the solver, thus saving time and resources.
Several high productivity tools such as advanced dummy positioning, seat morphing, belt fitting and airbag folder are provided in **Visual-Safe,** a dedicated application to safety utilities.

Visual-Mesh is a complete meshing tool supporting CAD import, 1D/2D/3D meshing and editing for linear and quadratic meshes. It supports all meshing capabilities, like shell and solid automesh, batch meshing, topo mesh, layer mesh, etc. A convenient Meshing Process guides you to mesh the given CAD component or full vehicle automatically.

Visual-Viewer built on a multi-page/multi-plot environment, enables data grouping into pages and plots. The application allows creation of any number of pages with up to 16 windows on a single page. These windows can be plot, animation, video, model or drawing block windows. Visual-Viewer performs automated tasks and generates customized reports and thereby increasing engineers' productivity.

ESI Group **www.esi-group.com**

Visual-Process provides a whole suite of generic templates based on LS-DYNA solver (et altera). It enables seamless and interactive process automation through customizable LS-DYNA based templates for automated CAE workflows.

All generic process templates are easily accessible within the unique framework of Visual-Environment and can be customized upon request and based on customer's needs.

Visual*DSS* is a framework for Simulation Data and Process Management which connects with Visual-Environment and supports product engineering teams, irrespective of their geographic location, to make correct and realistic decisions throughout the virtual prototyping phase. Visual*DSS* supports seamless connection with various CAD/PLM systems to extract the data required for building virtual tests as well as building and chaining several virtual tests upstream and downstream to achieve an integrated process. It enables the capture, storage and reuse of enterprise knowledge and best practices, as well as the automation of repetitive and cumbersome tasks in a virtual prototyping process, the propagation of engineering changes or design changes from one domain to another.

JSOL

JSOL Corporation **www.jsol.co.jp/english/cae/**

HYCRASH

Easy-to-use one step solver, for Stamping-Crash Coupled Analysis. HYCRASH only requires the panels' geometry to calculate manufacturing process effect, geometry of die are not necessary. Additionally, as this is target to usage of crash/strength analysis, even forming analysis data is not needed. If only crash/strength analysis data exists and panel ids is defined. HYCRASH extract panels to calculate it's strain, thickness, and map them to the original data.

JSTAMP/NV

As an integrated press forming simulation system for virtual tool shop the JSTAMP/NV meets the various industrial needs from the areas of automobile, electronics, iron and steel, etc. The JSTAMP/NV gives satisfaction to engineers, reliability to products, and robustness to tool shop via the advanced technology of the JSOL Corporation.

JMAG

JMAG uses the latest techniques to accurately model complex geometries, material properties, and thermal and structural phenomena associated with electromagnetic fields. With its excellent analysis capabilities, JMAG assists your manufacturing process

Livermore Software Technology Corp. **www.lstc.com**

LS-DYNA

A general-purpose finite element program capable of simulating complex real world problems. It is used by the automobile, aerospace, construction, military, manufacturing, and bioengineering industries. LS-DYNA is optimized for shared and distributed memory Unix, Linux, and Windows based, platforms, and it is fully QA'd by LSTC. The code's origins lie in highly nonlinear, transient dynamic finite element analysis using explicit time integration.

LS-PrePost: An advanced pre and post-processor that is delivered free with LS-DYNA. The user interface is designed to be both efficient and intuitive. LS-PrePost runs on Windows, Linux, and Macs utilizing OpenGL graphics to achieve fast rendering and XY plotting.

LS-OPT: LS-OPT is a standalone Design Optimization and Probabilistic Analysis package with an interface to LS-DYNA. The graphical preprocessor LS-OPTui facilitates definition of the design input and the creation of a command file while the postprocessor provides output such as approximation accuracy, optimization convergence, tradeoff curves, anthill plots and the relative importance of design variables.

LS-TaSC: A Topology and Shape Computation tool. Developed for engineering analysts who need to optimize structures, LS-TaSC works with both the implicit and explicit solvers of LS-DYNA. LS-TaSC handles topology optimization of large non-linear problems, involving dynamic loads and contact conditions.

LSTC Dummy Models:

Anthropomorphic Test Devices (ATDs), as known as "crash test dummies", are life-size mannequins equipped with sensors that measure forces, moments, displacements, and accelerations.

LSTC Barrier Models: LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) model.

Material Sciences Corporation www.materials-sciences.com

Materials Sciences Corporation has provided engineering services to the composites industry since 1970. During this time, we have participated in numerous programs that demonstrate our ability to: perform advanced composite design, analysis and testing; provide overall program management; work in a team environment; and transition new product development to the military and commercial sectors. MSC's corporate mission has expanded beyond basic research and development now to include transitioning its proprietary technologies from the research lab into innovative new products. This commitment is demonstrated through increased staffing and a more than 3-fold expansion of facilities to allow in-house manufacturing and testing of advanced composite materials and structures

Materials Sciences Corporation (MSC) MAT161/162 - enhanced features have been added to the Dynamic Composite Simulator module of LS-DYNA.

This enhancement to LS-DYNA, known as MAT161/162, enables the most effective and accurate dynamic progressive failure modeling of composite structures to enable the most effective and accurate dynamic progressive failure modeling of composite structures currently available.

MSC/LS-DYNA Composite Software and Database -

Fact Sheet: http://www.materials-sciences.com/dyna-factsheet.pdf

- MSC and LSTC have joined forces in developing this powerful composite dynamic analysis code.
- For the first time, users will have the enhanced ability to simulate explicit dynamic engineering problems for composite structures.
- The integration of this module, known as 'MAT 161', into LS-DYNA allows users to account for progressive damage of various fiber, matrix and interply delamination failure modes.
- Implementing this code will result in the ability to optimize the design of composite structures, with significantly improved survivability under various blast and ballistic threats.

MSC's LS-DYNA module can be used to characterize a variety of composite structures in numerous applications—such as this composite hull under blast

Oasys Ltd. LS-DYNA Environment www.oasys-software.com/dyna

The Oasys Suite of software is exclusively written for LS-DYNA® and is used worldwide by many of the largest LS-DYNA® customers. The suite comprises of:

Oasys PRIMER

Key benefits:

- Pre-Processor created specifically for LS-DYNA®
- Compatible with the latest version of LS-DYNA®
- Maintains the integrity of data
- Over 6000 checks and warnings – many auto-fixable
- Specialist tools for occupant positioning, seatbelt fitting and seat squashing (including setting up pre-simulations)
- Many features for model modification, such as part replace
- Ability to position and depenetrate impactors at multiple locations and produce many input decks automatically (e.g. pedestrian impact, interior head impact)
- Contact penetration checking and fixing
- Connection feature for creation and management of connection entities.
- Support for Volume III keywords and large format/long labels
- Powerful scripting capabilities allowing the user to create custom features and processes

www.oasys-software.com/dyna

Oasys D3PLOT

Key benefits:

- Powerful 3D visualization post-processor created specifically for LS-DYNA®
- Fast, high quality graphics
- Easy, in-depth access to LS-DYNA® results
- Scripting capabilities allowing the user to speed up post-processing, as well as creating user defined data components

www.predictiveengineering.com

Predictive Engineering provides finite element analysis consulting services, software, training and support to a broad range of engineering companies across North America. We strive to exceed client expectations for accuracy, timeliness and knowledge transfer. Our process is both cost-effective and collaborative, ensuring all clients are reference clients.

Our mission is to be honest brokers of information in our consulting services and the software we represent.

Our History

Since 1995, Predictive Engineering has continually expanded its client base. Our clients include many large organizations and industry leaders such as SpaceX, Nike, General Electric, Navistar, FLIR Systems, Sierra Nevada Corp, Georgia-Pacific, Intel, Messier-Dowty and more. Over the years, Predictive Engineering has successfully completed more than 800 projects, and has set itself apart on its strong FEA, CFD and LS-DYNA consulting services.

恒士达科技
Hengstar Tech.

Shanghai Hengstar **www.hengstar.com**

Center of Excellence: Hengstar Technology is the first LS-DYNA training center of excellence in China. As part of its expanding commitment to helping CAE engineers in China, Hengstar Technology will continue to organize high level training courses, seminars, workshops, forums etc., and will also continue to support CAE events such as: China CAE Annual Conference; China Conference of Automotive Safety Technology; International Forum of Automotive Traffic Safety in China; LS-DYNA China users conference etc.

On Site Training: Hengstar Technology also provides customer customized training programs on-site at the company facility. Training is tailored for customer needs using LS-DYNA such as material test and input keyword preparing; CAE process automation with customized script program; Simulation result correlation with the test result; Special topics with new LS-DYNA features etc..

Distribution & Support: Hengstar distributes and supports LS-DYNA, LS-OPT, LS-Prepost, LS-TaSC, LSTC FEA Models; Hongsheng Lu, previously was directly employed by LSTC before opening his distributorship in China for LSTC software. Hongsheng visits LSTC often to keep update on the latest software features.

Hengstar also distributes and supports d3View; Genesis, Visual DOC, ELSDYNA; Visual-Crash Dyna, Visual-Process, Visual-Environment; EnkiBonnet; and DynaX & MadyX etc.

Consulting

As a consulting company, Hengstar focuses on LS-DYNA applications such as crash and safety, durability, bird strike, stamping, forging, concrete structures, drop analysis, blast response, penetration etc with using LS-DYNA's advanced methods: FEA, ALE, SPH, EFG, DEM, ICFD, EM, CSEC..

Lenovo www.lenovo.com

Lenovo is a USD39 billion personal and enterprise technology company, serving customers in more than 160 countries.

Dedicated to building exceptionally engineered PCs, mobile Internet devices and servers spanning entry through supercomputers, Lenovo has built its business on product innovation, a highly efficient global supply chain and strong strategic execution. The company develops, manufactures and markets reliable, high-quality, secure and easy-to-use technology products and services.

Lenovo acquired IBM's x86 server business in 2014. With this acquisition, Lenovo added award-winning System x enterprise server portfolio along with HPC and CAE expertise.

Cloud - HPC Services - Subscription

Contact: JSOL Corporation Engineering Technology Division cae-info@sci.jsol.co.jp

Cloud computing services
for
JSOL Corporation LS-DYNA users in Japan

JSOL Corporation is cooperating with chosen cloud computing services

JSOL Corporation, a Japanese LS-DYNA distributor for Japanese LS-DYNA customers.

LS-DYNA customers in industries / academia / consultancies are facing increased needs for additional LS-DYNA cores

In calculations of optimization, robustness, statistical analysis, we find that an increase in cores of LS-DYNA are needed, for short term extra projects or cores.

JSOL Corporation is cooperating with some cloud computing services for JSOL's LS-DYNA users and willing to provide short term license.

This service is offered to customers using Cloud License fee schedule, the additional fee is less epensive than purchasing yearly license.

The following services are available (only in Japanese). HPC OnLine:

NEC Solution Innovators, Ltd.
http://jpn.nec.com/manufacture/machinery/hpc_online/

Focus
Foundation for Computational Science
http://www.j-focus.or.jp

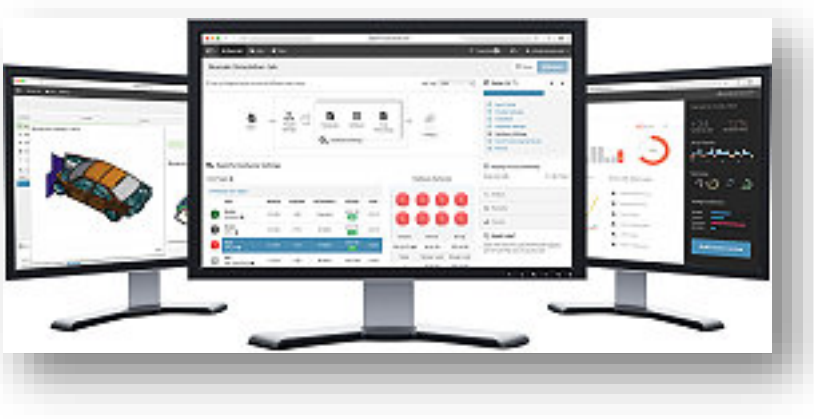
Platform Computation Cloud
CreDist.Inc.

PLEXUS CAE
Information Services International-Dentsu, Ltd. (ISID) https://portal.plexusplm.com/plexus-cae/

SCSK Corporation
http://www.scsk.jp/product/keyword/keyword07.html

Cloud - HPC Services - Subscription

www.rescale.com



Rescale: Cloud Simulation Platform

The Power of Simulation Innovation
We believe in the power of innovation. Engineering and science designs and ideas are limitless. So why should your hardware and software be limited? You shouldn't have to choose between expanding your simulations or saving time and budget.

Using the power of cloud technology combined with LS-DYNA allows you to:
· Accelerate complex simulations and fully explore the design space
· Optimize the analysis process with hourly software and hardware resources
· Leverage agile IT resources to provide flexibility and scalability

True On-Demand, Global Infrastructure
Teams are no longer in one location, country, or even continent. However, company data centers are often in one place, and everyone must connect in, regardless of office. For engineers across different regions, this can cause connection issues, wasted time, and product delays.

Rescale has strategic/technology partnerships with infrastructure and software providers to offer the following:
· Largest global hardware footprint – GPUs, Xeon Phi, InfiniBand
· Customizable configurations to meet every simulation demand
· Worldwide resource access provides industry-leading tools to every team
· Pay-per-use business model means you only pay for the resources you use
· True on-demand resources – no more queues

ScaleX Enterprise: Transform IT, Empower Engineers, Unleash Innovation
The ScaleX Enterprise simulation platform provides scalability and flexibility to companies while offering enterprise IT and management teams the opportunity to expand and empower their organizations.

Cloud - HPC Services - Subscription

Rescale Cloud Simulation Platform www.rescale.com

ScaleX Enterprise allows enterprise companies to stay at the leading edge of computing technology while maximizing product design and accelerating the time to market by providing:

- Collaboration tools
- Administrative control
- API/Scheduler integration
- On-premise HPC integration

Industry-Leading Security

Rescale has built proprietary, industry-leading security solutions into the platform, meeting the needs of customers in the most demanding and competitive industries and markets.

- Manage engineering teams with user authentication and administrative controls
- Data is secure every step of the way with end-to-end data encryption
- Jobs run on isolated, kernel-encrypted, private clusters
- Data centers include biometric entry authentication
- Platforms routinely submit to independent external security audits

Rescale maintains key relationships to provide LS-DYNA on demand on a global scale. If you have a need to accelerate the simulation process and be an innovative leader, contact Rescale or the following partners to begin running LS-DYNA on Rescale's industry-leading cloud simulation platform.

LSTC - DYNAmore GmbH JSOL Corporation

Rescale, Inc. - 1-855-737-2253 (1-855-RESCALE) - info@rescale.com

944 Market St. #300, San Francisco, CA 94102 USA

Cloud - HPC Services - Subscription

ESI Cloud Based Virtual Engineering Solutions

www.esi-group.com

ESI Cloud offers designers and engineers cloud-based computer aided engineering (CAE) solutions across physics and engineering disciplines.

ESI Cloud combines ESI's industry tested virtual engineering solutions integrated onto ESI's Cloud Platform with browser based modeling,

With ESI Cloud users can choose from two basic usage models:

- An end-to-end SaaS model: Where modeling, multi-physics solving, results visualization and collaboration are conducted in the cloud through a web browser.
- A Hybrid model: Where modeling is done on desktop with solve, visualization and collaboration done in the cloud through a web browser.

Virtual Performance Solution:

ESI Cloud offers ESI's flagship Virtual Performance Solution (VPS) for multi-domain performance simulation as a hybrid offering on its cloud platform. With this offering, users can harness the power of Virtual Performance Solution, leading multi-domain CAE solution for virtual engineering of crash, safety, comfort, NVH (noise, vibration and harshness), acoustics, stiffness and durability.

In this hybrid model, users utilize VPS on their desktop for modeling including geometry, meshing and simulation set up. ESI Cloud is then used for high performance computing with an integrated visualization and real time collaboration offering through a web browser.

The benefits of VPS hybrid on ESI Cloud include:

- Running large concurrent simulations on demand
- On demand access to scalable and secured cloud HPC resources
- Three tiered security strategy for your data
- Visualization of large simulation data sets
- Real-time browser based visualization and collaboration
- Time and cost reduction for data transfer between cloud and desktop environments
- Support, consulting and training services with ESI's engineering teams

Cloud - HPC Services - Subscription

www.esi-group.com

VPS On Demand

ESI Cloud features the Virtual Performance Solution (VPS) enabling engineers to analyze and test products, components, parts or material used in different engineering domains including crash and high velocity impact, occupant safety, NVH and interior acoustics, static and dynamic load cases. The solution enables VPS users to overcome hardware limitations and to drastically reduce their simulation time by running on demand very large concurrent simulations that take advantage of the flexible nature of cloud computing.

Key solution capabilities:

- Access to various physics for multi-domain optimization
- Flexible hybrid model from desktop to cloud computing
- On demand provisioning of hardware resources
- Distributed parallel processing using MPI (Message Passing Interface) protocol
- Distributed parallel computing with 10 Gb/s high speed interconnects

Result visualization

ESI Cloud deploys both client-side and server-side rendering technologies. This enables the full interactivity needed during the simulation workflow along with the ability to handle large data generated for 3D result visualization in the browser, removing the need for time consuming data transfers. Additionally ESI Cloud visualization engine enables the comparisons of different results through a multiple window user interface design.

Key result visualization capabilities:

- CPU or GPU based client and server side rendering
- Mobility with desktop like performance through the browser
- 2D/3D VPS contour plots and animations
- Custom multi-window system for 2D plots and 3D contours
- Zooming, panning, rotating, and sectioning of multiple windows

Collaboration

To enable real time multi-user and multi company collaboration, ESI Cloud offers extensive synchronous and asynchronous collaboration capabilities. Several users can view the same project, interact with the same model results, pass control from one to another. Any markups, discussions or annotations can be archived for future reference or be assigned as tasks to other members of the team.

Key collaboration capabilities:

- Data, workflow or project asynchronous collaboration
- Multi-user, browser based collaboration for CAD, geometry, mesh and results models
- Real-time design review with notes, annotations and images archiving and retrieval
- Email invite to non ESI Cloud users for real time collaboration

Excerpt Courtesy Copyright to DaimlerChrysler

Maximum modularity for all customer wishes: The new Sprinter - Intelligent, interactive and innovative

- Strong performer in all sub-disciplines: the Sprinter defines the premium class in its segment New connectivity solutions: Mercedes PRO connect services ensure a quantum leap in the efficiency of fleet management
- Equal to any transport requirement: number of variants increased yet again Clever overall system solution: a combination of different attributes makes the Sprinter the perfect vehicle for tradespeople
- Important mounting points retained: bodybuilders can rely on a well-established basis

A fascinating design, safety features at a very high level, maximum cost-effectiveness, customer and sector-oriented details and a connectivity package that takes infotainment systems and telematics applications into a new era: in every sub-discipline, the third generation of the Sprinter defines the top class in the large van segment. However, where the founder of this segment actually shows its true strengths is in combining its individual attributes into an overall system solution.

"In the logistics and transport world of the future, variability and the availability of customer-specific solutions are the essential success factor. Just offering customers a good vehicle is no longer enough. As an all-rounder, the new Sprinter must be more than just the sum of its parts. With an unprecedented number of variants, new connectivity services and a new telematics generation, it is a tailor-made end-to-end system meeting an enormous range of commercial transport and mobility requirements. This means that the new Sprinter achieves precisely what its preceding generations demonstrated before it: once again, it redefines the van segment. This makes it the ultimate in smart hardware, and it will raise its segment, the business of our customers and our own business to the next level", says Volker Mornhinweg, Head of Mercedes-Benz Vans.

Courtesy and copyright to DefenseAerospace

Successful First Flight for GlobalEye

Saab's new GlobalEye Airborne Early Warning & Control aircraft photographed during its March 14 maiden flight. The aircraft, a modified Bombardier Global 6000 business jet, is fitted with an Erieye radar in the housing abode the fuselage. (Saab photo)

GlobalEye took off on its maiden flight at 12.52 local time on 14 March 2018, from Saab's airfield in Linköping, Sweden. The aircraft, a modified Bombardier Global 6000 jet platform, undertook a 1 hour 46 minutes test flight collecting extensive flight-test data using the on-board instrumentation suite. This data is then used to verify the aircraft performance and associated modelling. The first flight was preceded by a series of ground trials including high and low speed taxiing tests.

"The first flight is the second major milestone for the GlobalEye programme within a very short space of time. Yet again we have demonstrated that we are delivering on our commitments and that we are on track with our production of the world's most advanced swing-role surveillance system," said Anders Carp, Senior Vice President and head of Saab's business area Surveillance.

"Today's flight went as planned, with the performance level matching our high expectations. The aircraft's smooth handling was just as predicted and a real pleasure for me to fly," said Magnus Fredriksson, Saab Experimental Test Pilot.

The maiden flight took place three weeks after Saab revealed the GlobalEye aircraft to the media for the first time on 23 February 2018. GlobalEye combines air, maritime and ground surveillance in one swing-role solution. GlobalEye carries a full suite of sophisticated sensors including the powerful new extended range radar (Erieye ER), integrated with the ultra-long range Global 6000 aircraft, known for its versatility and smooth flight characteristics.

The GlobalEye launch customer is the United Arab Emirates Armed Forces, where it is known as the Swing Role Surveillance System (SRSS). The initial order was placed in November 2015. GlobalEye brings extended detection range, endurance and the ability to perform multiple roles, including tasks such as search and rescue, border surveillance and military operations.

Bombardier and Global 6000 are trademarks of Bombardier Inc. or its subsidiaries.
Saab serves the global market with world-leading products, services and solutions within military defence and civil security. Saab has operations and employees on all continents around the world. Through innovative, collaborative and pragmatic thinking, Saab develops, adopts and improves new technology to meet customers' changing needs.

Distribution, Consulting, Training

Canada	**Metal Forming Analysis Corp MFAC**		galb@mfac.com	
	www.mfac.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	
	eta/DYNAFORM	INVENTIUM/PreSys		

Mexico	**COMPLX**		Armando Toledo	
	www.complx.com.mx /		armando.toledo@complx.com.mx	
	LS-DYNA	LS-OPT	LS-PrePost	
			LS-TAsc Barrier/Dummy Models	

United States	**DYNAMAX**		sales@dynamax-inc.com	
	www.dynamax-inc.com			
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	LSTC Dummy Models		LSTC Barrier Models	

United States	**Livermore Software Technology Corp**		sales@lstc.com	
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	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	

Distribution, Consulting, Training

United States

ESI Group N.A **info@esi-group.com**

www.esi-group.com

PAM-STAMP

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VA One	CFD-ACE+	ProCAST	
	Weld Planner	Visual-Environment	IC.IDO

United States

Engineering Technology Associates – ETA etainfo@eta.com www.eta.com

INVENTIUM/PreSy	NISA	VPG	LS-DYNA
LS-OPT	DYNAform		

United States

Predictive Engineering info@predictiveengineering.com www.predictiveengineering.com

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Barrier Models		LSTC Dummy Models	

Distributor for Siemens PLM Software at www.AppliedCAx.com (FEMAP, NX Nastran, STAR CCM+, NX CAD/CAM/CAE)

Distribution, Consulting, Training

France	**DynaS+**		v.lapoujade@dynasplus.com	
	www.dynasplus.com		Oasys Suite	
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	DYNAFORM	VPG	MEDINA	
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		AnyBody		
	ANSYS/LS-DYNA			

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	Primer	FEMZIP	GENESIS	Oasys Suite
	TOYOTA THUMS		LSTC Dummy & Barrier Models	

The Netherlands	**Infinite Simulation Systems B.V**		j.mathijssen@infinite.nl	
	www.infinite.nl			
	ANSYS Products	CivilFem	CFX	Fluent
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Russia	**Limited Liability DynaRu**		office@lsdyna.ru	
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	www.dynamore.eu				
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	LSTC Barrier Models		DIGIMAT		
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	FormingSuite		LSTC Dummy Models		
			LSTC Barrier Models		
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	LS-TaSC		LSTC Dummy Models &	Barrier Models	
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	www.oasys-software.com/dyna		TOYOTA THUMS		
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	LS-TaSC		PRIMER	D3PLOT	T/HIS
	REPORTER	SHELL	FEMZIP	HYCRASH	
	DIGIMAT	Simpleware	LSTC Dummy Models		
			LSTC Barrier Models		

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	www.eta.com/cn			
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	DIGIMAT	FEMZIP	LSTC Barrier Models	LS-TaSC
China	**Shanghai Hengstar Technology**		info@hengstar.com	
	www.hengstar.com			
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	LS-PrePOST	LS-OPT	LSTC Dummy Models	
	Genesis	VisualDoc		ELSDYNA
	Visual-Crahs DYNA	Visual-Proeces		DynaX & MadyX
	Enki Bonnet	Visual Environement		

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	www.oasys-software.com/dyna			
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			LS-DYNA	LSTC Barrier Models	LS-TaSC

India	**CADFEM India**		info@cadfem.in	
	www.cadfem.in			
	ANSYS	VPS	optiSLang	
	LS-DYNA	LS-OPT	LS-PrePost	

India	**Kaizenat Technologies Pvt. Ltd**		support@kaizenat.com	
	http://kaizenat.com /			
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
	Complete LS-DYNA suite of products		LSTC Barrier Models	LS-TaSC

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	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
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Japan	**JSOL**			
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	JSTAMP	HYCRASH	JMAG	
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	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	

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	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	Planets
	eta/DYNAFORM	FormingSuite	Simblow	TrueGRID
	JSTAMP/NV	Scan IP	Scan FE	Scan CAD
	FEMZIP			

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	www.kostech.co.kr			
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	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM
	eta/DYNAFORM	DIGIMAT	Simuform	Simpack
	AxStream	TrueGrid	FEMZIP	

Taiwan **AgileSim Technology Corp.**

www.agilesim.com.tw

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Taiwan **Flotrend**

www.flotrend.com.tw

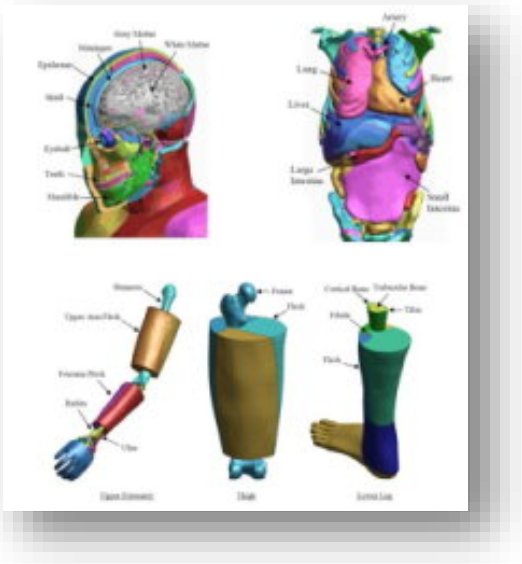
LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Taiwan **SiMWARE Inc..**

www.simware.com.tw

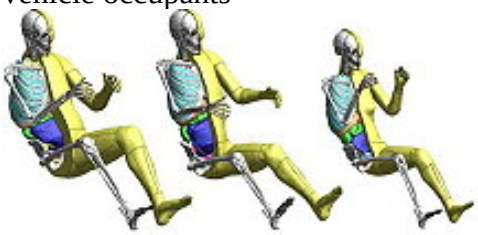
LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

TOYOTA - Total Human Model for Safety – THUMS

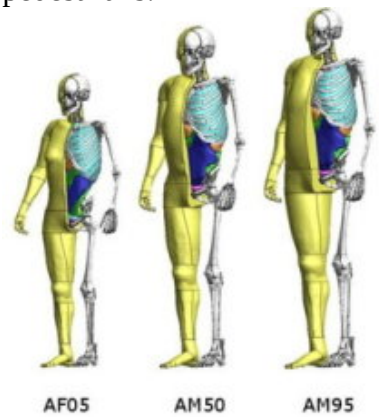


The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons, and internal organs. Therefore, THUMS can be used in automotive crash simulations to identify safety problems and find their solutions.

Each of the different sized models is available as sitting model to represent vehicle occupants



and as standing model to represent pedestrians.



The internal organs were modeled based on high resolution CT-scans.

THUMS is limited to civilian use and may under no circumstances be used in military applications.

LSTC is the US distributor for THUMS. Commercial and academic licenses are available.

For information please contact: THUMS@lstc.com

THUMS®, is a registered trademark of Toyota Central R&D Labs.

LSTC – Dummy Models

LSTC Crash Test Dummies (ATD)

Meeting the need of their LS-DYNA users for an affordable crash test dummy (ATD), LSTC offers the LSTC developed dummies at no cost to LS-DYNA users.

LSTC continues development on the LSTC Dummy models with the help and support of their customers. Some of the models are joint developments with their partners.

e-mail to: atds@lstc.com

Models completed and available (in at least an alpha version)

- Hybrid III Rigid-FE Adults
- Hybrid III 50th percentile FAST
- Hybrid III 5th percentile detailed
- Hybrid III 50th percentile detailed
- Hybrid III 50th percentile standing
- EuroSID 2
- EuroSID 2re
- SID-IIs Revision D
- USSID
- Free Motion Headform
- Pedestrian Legform Impactors

Models In Development

- Hybrid III 95th percentile detailed
- Hybrid III 3-year-old
- Hybrid II
- WorldSID 50th percentile
- THOR NT FAST
- Ejection Mitigation Headform

Planned Models

- FAA Hybrid III
- FAST version of THOR NT
- FAST version of EuroSID 2
- FAST version of EuroSID 2re
- Pedestrian Headforms
- Q-Series Child Dummies
- FLEX-PLI

LSTC – Barrier Models

Meeting the need of their LS-DYNA users for affordable barrier models, LSTC offers the LSTC developed barrier models at no cost to LS-DYNA users.

LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) models:

- ODB modeled with shell elements
- ODB modeled with solid elements
- ODB modeled with a combination of shell and solid elements

- MDB according to FMVSS 214 modeled with shell elements
- MDB according to FMVSS 214 modeled with solid elements
- MDB according to ECE R-95 modeled with shell elements
- AE-MDB modeled with shell elements

- IIHS MDB modeled with shell elements
- IIHS MDB modeled with solid elements
- RCAR bumper barrier

- RMDB modeled with shell and solid elements

e-mail to: atds@lstc.com.

15th International LS-DYNA® Users Conference & Users Meeting

June 10-12, 2018

Edward Hotel & Convention Center
Dearborn. MI. USA

For Booth & Sponsorship information contact Dilip@lstc.com

The conference will host a forum for engineers, professors, students, consultants, industry leaders, and interested parties to exchange their ideas, and listen to the latest in industry and academic presentations..

The presenter (1) One Presenter of the accepted paper will receive a complimentary (no fee) conference registration, when they register using the "LSTC Conference" group registration code at the Edward Hotel.

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Training - Dynamore

Author: Christian Frech christian.frech@dynamore.de

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Seminars	May 18	Jun 18	Jul 18	Aug 18	Sep 18	Oct 18	Nov 18	Dec 18
Introduction to LS-DYNA F. Andrade, T. Graf, S. Mattern	02 29	05	17		11 18	03 29	13	04 04
Introduction to LS-PrePost S. Mandel		04			10 17			03
Nonlinear Implicit Analyses N. Karajan, T. Erhart	04		20					07

If not otherwise stated, the event location is Stuttgart, Germany. Other event locations are:
G = Gothenburg, Sweden; L = Linköping, Sweden V = Versailles, France; T = Turin, Italy,
Tr = Traboch, Austria, Z = Zurich, Switzerland

We hope that our offer will meet your needs and are looking forward to welcoming you at one of the events.

15th Weimar Optimization and Stochastic Days 2018

June 21-22, 2018

Conference for CAE-based parametric Optimization, stochastic analysis and Robust Design Optimization (RDO).

Motto 2018:
Parameter identification in virtual product development - from model calibration to the real-time analysis of machine conditions using digital twins

The conference offers focused information and training in practical seminars and interdisciplinary lectures. Users can talk about their experiences in parametric optimization, service providers present their new developments and scientific research institutions inform about state-of-the-art RDO methodology.

Information and registration at:
http://www.dynardo.de/en/wost.html

Veranstaltungsort / Venue:
congress centrum neue weimarhalle
Seminar Building
UNESCO-Platz 1
99423 Weimar

Training - LSTC

www.lstc.com

MAY					
1-2	Tues-Wed	MI	Composite Materials in LS-DYNA	2	A. Tabiei
3-4	Thurs-Fri	MI	Rubber, Foam, and Viscoelastic Materials in LS-DYNA	2	A. Tabiei
Pre-Conference & Post-Conference Training available! Sunday, June 10 as well as Wednesday-Thursday, June 13-14, at the Edward Hotel & Convention Center, Dearborn, MI *For complete list of classes, please visit the Conference website:* 15th International LS-DYNA Conference & User Meeting					
JUNE					
18	Mon	MI	Intro to LS-PrePost	1	P. Ho / Q. Yan
19-22	Tues-Fri	MI	Intro to LS-DYNA	3.5	J. Reid
JULY					
12-13	Thurs-Fri	CA	Smoothed Particle Galerkin Method And Peridynamics For Failure Analysis	2	Y. Wu / B. Ren
30	Mon	CA	Material Characterization for Metals, Plastics & Polymers: From Test Data to Material Model	1	S. Bala
31	Tues	CA	Contact in LS-DYNA	1	S. Bala

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ESI Group	www.esi-group.com
ETA	www.eta.com
Lancemore	www.lancemore.jp/index_en.html
Lenovo	

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Editor: Yanhua Zhao - yanhua@feainformation.com

LS-DYNA Metal Forming New Features - Table 1: www.lstc.com/new_features

Table 1 Paper 1-10 Introducing *BOUNDARY_SPC_SYMMETRY_PLANE (SET)
Xinhai Zhu, Li Zhang, and Yuzhong Xiao - LSTC

This keyword constrains nodes that are within some distances (a tolerance) of a defined plane to have no motion orthogonal to that plane. This keyword is used for a geometric symmetry plane, so that the full geometry does not have to be modeled.

1-1 A Customized Job Manager for Metal Forming Simulations Y. Xiao, X. Zhu, L. Zhang, H. Fan	**1-2 Conversion between FLD and Stress Triaxial Limit Curve** X. Zhu, L. Zhang, Y. Xiao
1-3 Best Fit GUI for Metal Forming in LS-PrePost® 4.5 Q. Yan, X. Zhu, P. Ho, L. Zhang, Y. Xiao	**1-4 Improvement of Sandwich Structure Part Adaptivity in LS-DYNA** X. Zhu, H. Fan, L. Zhang and Y. Xiao
1-5 Defining Hardening Curve in LS-DYNA® X. Zhu, L. Zhang, Y. Xiao	**1-6 Lancing features in LS-DYNA** Q. Yan, L. Zhang, Y. Xiao, X. Zhu, P. Ho
1-7 Improvements to One-Step Simulation in LS-DYNA, X. Zhu, H. Fan, L. Zhang, Y. Xiao	**1-8 Recent improvements in LS-DYNA® hot stamping simulations** Jinglin Zheng, Xinhai Zhu and Houfu Fan
1-9 Improve time step size sensitivity in transient mechanical simulations J. Zheng and X. Zhu	

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The papers are located in full on FEA Publications - China Conference Papers

Fluid Structure interaction of a spoiler on the DrivAer car model

James Dilworth, Ben Ashby, Peter Young

A New Method of Transient Acoustic Simulation

Zhen Wu1,2, Milan Koch2, Christopher Morgan3, Enno Witfeld2, Qiang Liu1, Eryong Liu1

1 Autoliv (Shanghai) Vehicle Safety System Technical Center, 201807 Shanghai, China

2 Autoliv B.V. & Co. KG, Otto-Hahn-Strasse 4, 25333 Elmshorn, Germany

3 Autoliv Auburn Hills Technical Center, 1320 Pacific Drive Auburn Hills, 48326 Michigan, USA

Editor: Yanhua Zhao - yanhua@feainformation.com

New Features on the website www.lstc.com/new_features

LS-DYNA's Linear Solver Development — Phase 1: Element Validation

Allen T. Li (1), Zhe Cui (2), Yun Huang(2)
1 Ford Motor Company
2 Livermore Software Technology Corporation

Abstract: LS-DYNA is a well-known multi-purpose explicit and implicit finite element code. It is mainly used to analyze the nonlinear response of structures. To answer increasing requests from users, LSTC is taking a big effort to develop and improve the linear solution capabilities in LS-DYNA. As part of this endeavor, a joint project was launched between Ford and LSTC to validate the linear solvers in LS-DYNA.

Among the Previous Months Postings on New Features Table 2

- Recent updates in fatigue analysis with LS-DYNA
- Discussion on acoustic databases in LS-DYNA
- Modeling of Ductile Failure in Destructive Manufacturing Process Using the Smoothed Particle Galerkin Method
- A non-orthogonal material model of woven composites in the preforming process
- LSTC WinSuite – a complete solution for the Windows platform
- Modeling and Numerical Simulation of Afterburning of Thermobaric Explosives In a Closed Chamber
- Thick Shell Element Form 5 in LS-DYNA
- New Inflator Models in LS-DYNA®
- New features of 3D adaptivity in LS-DYNA
- Thermal Coupling Method Between SPH Particles and Solid Elements in LS-DYNA
- LS-DYNA Smooth Particle Galerkin (SPG) Method