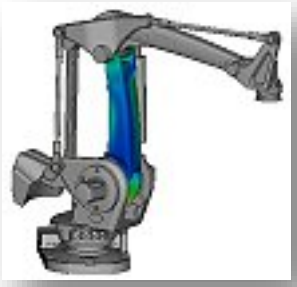
fea INFORMATION Engineering Solutions

LSTC Livermore Software Technology Corp.

Volume 7, Issue 05, May 2018

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

BETA CAE Systems



15th LS-DYNA® International Conference Special Section

Agera R

ESI - App for smart Pedestrian Protection Simulation

LS-DYNA New Features:

Scalability study of particle method with dynamic load balancing in LS-DYNA®
Hailong Teng, LSTC

On Mesh Fusion Scheme in LS-DYNA®
Ninshu Ma, Osaka Univ - Houfu Fan & Xinhai Zhu, LSTC

FEA Information 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

Highlights from the upcoming 15th International LS-DYNA Conference.

Announcements

Agenda is now posted and Exhibitor Map

www.ls-dynaconferences.com

A special section at the end of the news is dedicated to information on the 15th International LS-DYNA Conference booth(s)

Visit ESI booth #305

Explore live an App for smart Pedestrian Protection Simulation
This pay and use, 'Fit-for-Purpose' web-based tool is easily accessible from anywhere.

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

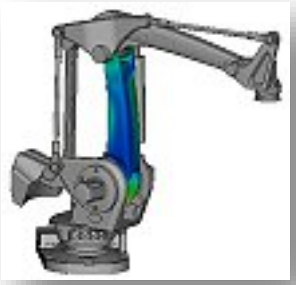
100	ETA	www.eta.com
101	Oasys	www.oasys-software.com/dyna/en /
103	DatapontLabs	www.datapointlabs.com/
105	Rescale	www.rescale.com
107	JSOL	www.jsol.co.jp/english/cae
201	BETA CAE	www.beta-cae.com /
301	Predictive Engineering	www.predictiveengineering.com
303	Shanghai Hengstar Technology	www.hengstar.com
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…



BETA CAE Systems announces the release of the version 18.1.1 of its software suite with new tools and capabilities to further augment functionality and facilitate CAE processes.

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Enhancements in ANSA

General: Nodes participating in the Explode View are now marked with a circle and are enclosed in a transparent sphere.

TRANSLATORS: Reference Sets are now supported in ANSA, offering the ability to filter data according to Reference Sets existing in *.jt model files.

AUXILIARIES>Inverse Forming: If the Workpiece Initial Thickness is left blank, it is automatically calculated based on the Property, or available nodal thickness.

Known issues resolved in ANSA

DECKs: Moving entities from "Out of Include" section to an Include could lead to unexpected termination.

Model Browser: After part replace, the content of Sets would erroneously change from facets to elements.

Shell Mesh: Fill>Holes: Unexpected termination could occur when filling holes on second order elements when reshape option was enabled.

Decks: Unexpected termination would occur in case of databases with composite properties when switching between decks.

Enhancements in META

Decks: Support of Abaqus 2018. Support of FEMFAT fatigue results from *.h3d files.

Curves: Support of Altair Binary Format *.th files.

Toolbars: Occupant Injury Criteria: The Adult and Child Protection Scores, according to the selected Regulation, have been added in the PPTX report. The calculation of the score is supported for front and side Impact, front and rear passengers.

Known issues resolved in META

Handling Entities: ANSA User Attributes were not supported correctly in META.

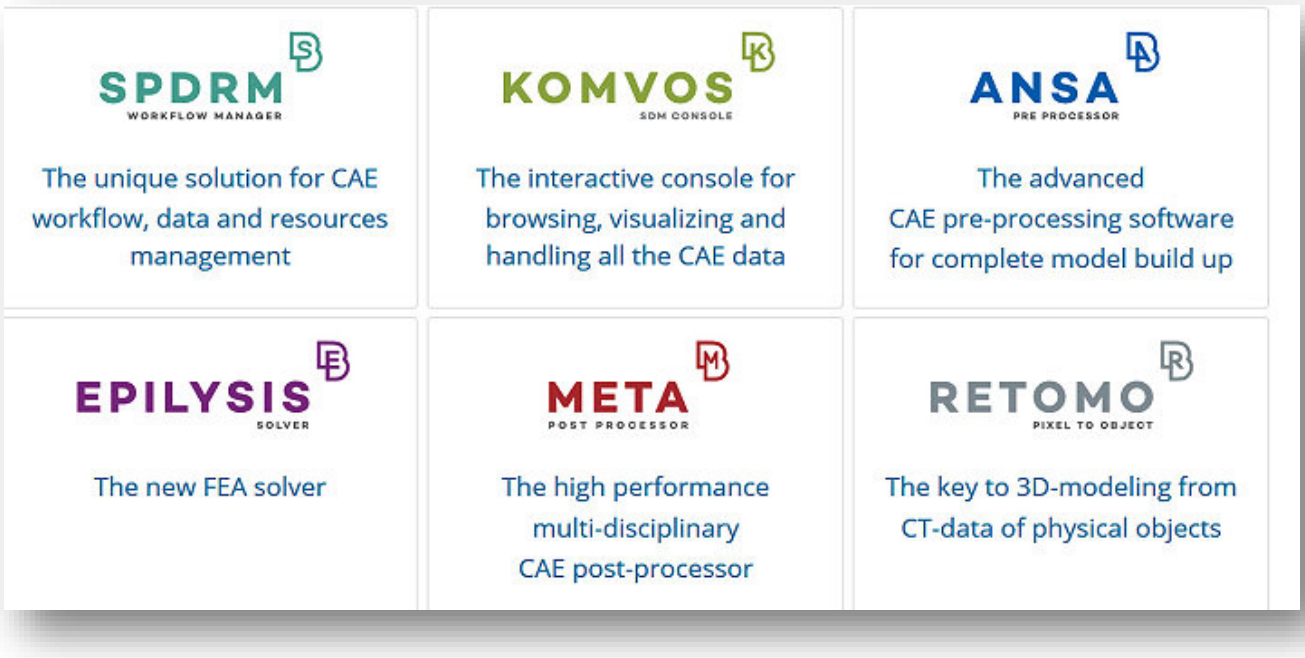
Curves: Elout history variables were not read correctly from binout files.

Axis: Axis values were not correct in some cases since v18.1.0.

New Documentation

- Aerospace Modeling with ANSA and META
- Creation and Management of Superelements with model Browser
- Flex Body Simulation

Complete Information: www.beta-cae.com/news/20180426_announcement_suite_v18.1.1.htm



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.

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.

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

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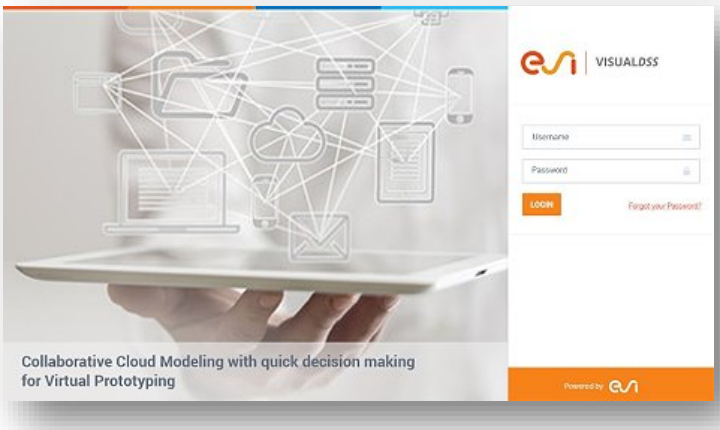
Industriestr. 2, D-70565 Stuttgart, Germany
Tel. +49 (0) 7 11 - 45 96 00 - 0
E-Mail: conference@dynamore.de
www.dynamore.de

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.

Visit ESI booth #305 to explore live an App for smart Pedestrian Protection Simulation

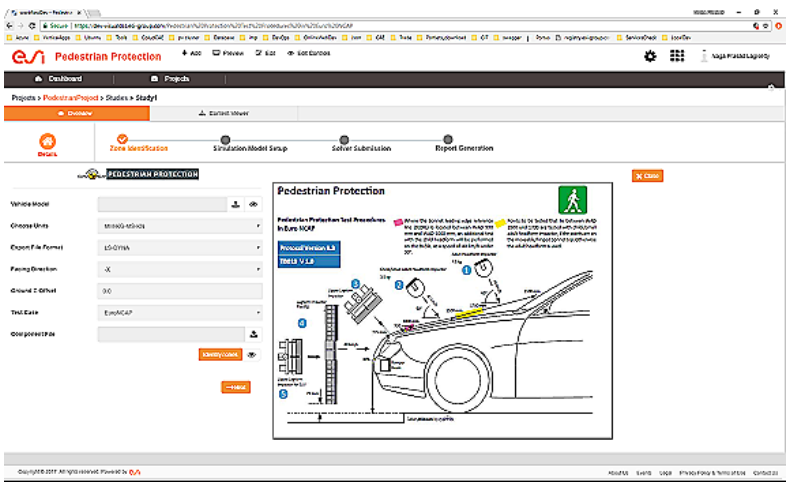


LS-DYNA Conference and Exhibition - Be 'App-to-date'

Explore the smart way of simulation using Pedestrian Protection App, a vertical app for Head Impact Simulation according to EuroNCAP.
This pay and use, 'Fit-for-Purpose' web-based tool is easily accessible from anywhere.

ESI's Pedestrian Protection App provides a generic automated workflow on cloud that enables execution of pre-defined workflows emulating operational best procedures through virtual tests and manage simulation data.

- Are your manual methods not reliable at all times and you wish to improve simulation to increase reliability?
- Interested in reducing time and corrective iterations, while increasing consistent results?
- Looking for a solution that easily and efficiently connects teams working from various locations and time zones?



www.esi-group.com/company/press/news-releases/esi-customer-hwaseung-ra-manages-product-reliability-while-cutting-development-time-and-costs

ESI Customer Hwaseung R&A Manages Product Reliability while Cutting Development Time and Costs

Simulation of a vehicle door seal installation with ESI Visual-Environment

The Korean automotive supplier leverages the power of ESI's Virtual Prototyping platform

Paris, France – March 13, 2018 – ESI Group is a leading innovator in Virtual Prototyping software and services for manufacturing industries, announces the successful application of virtual prototyping by Hwaseung R&A, Korean automotive supplier specialized in high & low pressure hoses and weather strips. Using the automation of trunk joint simulation processes in ESI Visual-Environment, the equipment manufacturer was able to correct seals defects and improve their design, while reducing development time and costs.

Hwaseung R&A, a company supplying automotive and other industrial rubber parts, faced a trunk seals issue that needed to be corrected, as it became deformed or distorted at the corners after assembly. The function of a trunk seal is to absorb vibrations and to close the gap between the vehicle body and trunk assembly. When the seal has an irregular shape the pressure on trunk panels is non-uniform, which degrades their ability to control of noise and water leakage can result in failure of trunk panels.

Hwaseung R&A's engineers looked to simulation to address their design problems and wanted a fully automatic model creation process. Their research led them to ESI's Virtual Prototyping solutions and specifically ESI Visual-Environment, a platform for Computer Aided Engineering (CAE) and simulation process automation.

Complete Article

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.

Join ETA for a day of education, keynotes and training exploring new technologies for more efficient product design and development. Topics will include lightweighting, optimization, advanced materials and metalstamping simulation through various papers, case studies and software demonstrations. The day will be capped off with an evening Riverboat Cruise on the Detroit River!

June 13th, 2018

2018 ETA Technology Summit - New technologies in product design & development

Schedule

7:30 - 8:30 am - Reg/Continental Breakfast
8:30 - 4:00 pm - Program and Keynotes
5:00 - 8:00 pm - Detroit Princess Riverboat Cruise

Location: Atheneum Suite Hotel - 1000 Brush St, Detroit, MI 482261000 Brush St, Detroit, MI, **Detroit Princess Riverboat Cruise** - Civic Center Drive, Detroit, MI

Agenda:

Morning keynotes include:

- Steel Innovation, Lightweighting and Challenges, presented by John Catterall, Auto/Steel Partnership
- Roll Forming using LS-DYNA and DYNAFORM, Peter Vogel, DYNAMORE
- Recommendations for Effectively Using Multi-Physics Optimization, Paul Dolan, STEMCO
- An Introduction of 6th Generation DYNAFORM, Jenson Chen, DFE Tech
- ACP OpDesign – Optimal Design Gateway, Alexis Kaloudis, BETA CAE Systems

In the afternoon, ETA and partners will demo new software releases, and present case studies for composite and material modeling, manufacturing, and optimization.

Accomodations: Atheneum Suite Hotel - Special Block Rate of $165 per room with discounted valet. When calling the hotel, tell them that you are with ETA to receive the discount.

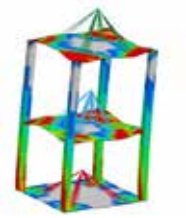
Sponsorships: Sponsorship opportunities are available. For more information, please email etainfo@eta.com.

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

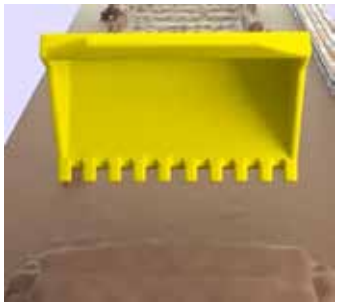
Postings every Monday on what you have missed

www.feantm.com



So you think Crash Hazard Shock is when I trip on the electric power cord and pull the coffee machine off the counter? Well, I do agree that could be quite a shock BUT this is different. SO, grab your grounding electric sneakers, and let's head on over to learn what it really is.
When components are mounted on military aircraft, predominantly for the U.S. military, they must conform to either MIL-STD-810G Section 513 or 516 for Crash Hazard Shock.

04/30/2018. Tractor Time!! Coffee to go, grab your tractors. Mine is a John Deere - go me, just the perfect size tractor. We are going dirt bucketing. Moving soil. LS-DYNA SPH: Cohesive soil modeling, Blender visualization - while I just pick up dirt and move it, it does mean to model it: Moving Least-Squares based formulation is used to model large deformations of cohesive soil. Okay that is moving BIG dirt, and I only have a small tractor - OR see below for my husband's tractor.



Okay his tractor is probably the one in the simulation BUT mine can do the same! So, HA! I just have to drink more coffee, and more dirt trips! And more coffee, well multiple coffee trips! Hmmm, good thing I own the coffee shop and don't pay for the coffee!

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.

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

Shanghai Enhu Informatio n 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.

Designers can avoid the challenges of trial and error. JSTAMP provides an adequate result and reduces the lead time and cost of tool design.

JSTAMP Functions Address various tasks in tool shop

JSTAMP represents the Sheet metal forming process virtually by numerical simulation. Users can examine the simulation result, output it to CAD, and directly use the CAD as a countermeasure by using JSTAMP.

JSTAMP provides comprehensive support throughout the design process from the first trial to the final stage. The feature for addressing complicated process stages, low formability materials, and latest technologies covers various tasks in the Sheet metal forming process.

EVENTS:

The 2018 THUMS USA Users' Meeting
Dates : Jun.13, 2018
Venue : Edward Hotel & Convention Cent…

J-OCTA Users Conference 2018
Dates : Nov..21, 2018
Venue : Tokyo Conference Center SHINAG…

LS-DYNA & JSTAMP Forum 2018
Dates : Oct..31, 2018
Venue : NAGOYA TOKYU HOTEL

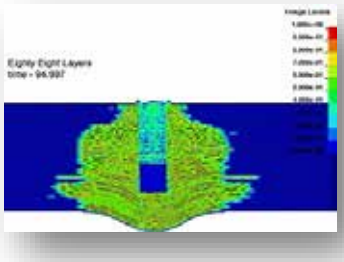
A team of engineers, mathematicians, & computer scientists develop LS-DYNA, LS-PrePost, LS-OPT, LS-TaSC, and LSTC's Dummy & Barrier models.

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.



Simulation Movie

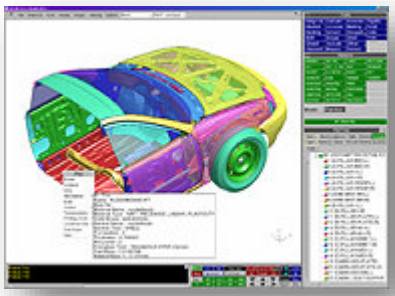
Penetration and Perforation of Moderately Thick Composites

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

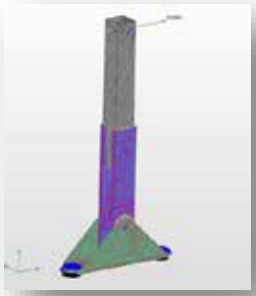
Predictive Engineering provides finite element analysis consulting services, software, training and support to a broad range of engineering companies across North America. We strive to exceed client expectations for accuracy, timeliness and knowledge transfer. Our process is both cost-effective and collaborative,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

Welcome to our new thermal analysis and CFD expert Clay Hearn

Clay Hearn, Phd, is Staff Mechanical Engineer at Predictive Engineering with over 15 years of experience.

Clay gained his initial experience at the the Center for Electromechanics (CEM), a self-funded research organization at the University of Texas at Austin. CEM specializes in applications of pulse power, energy storage, and advanced transportation technologies, and as research engineer, Clay worked on a wide variety of programs. Project highlights from this time include free piston linear compressors, fuel cell hybrid electric vehicles, composite flywheel energy storage, and magnetic bearings. Prior to joining Predictive Engineering, Clay was Senior Mechanical Engineer for Meggitt - OECO in Milwaukie, OR. OECO provides power generation and power conversion products for aerospace applications. As senior mechanical engineer he was involved in thermal management design and vibration analysis of advanced power conversion products.

In conjunction with his time at CEM, Clay earned his Doctorate in Mechanical Engineering from the University of Texas at Austin. His skills include expertise in structural and thermal FEA utilizing ABAQUS, PATRAN, SolidWorks Simulation, COSMOS/M, as well as CFD analysis utilizing SolidWorks Flow Simulation. Clay looks forward to exploring the capabilities of STAR-CCM+, FEMAP and LS-DYNA.



For clarity, here's a picture of the structure with the applied

Question 9 - Answer is located on the website.
http://www.predictiveengineering.com/content/fea-quiz

A buckling analysis has been requested of this simple C-channel structure. The load is in the positive X-direction and is applied through a beam element (simulating a large bolt) which is then connected to the plate elements via rigid links. The buckling analysis option is selected and the analysis proceeds. When the analysis completes, the first eigenvalue buckling mode is negative! For this particular model, the negative eigenvalue is -0.35. This would indicate a buckling load of -0.35*10,000 lbf = -3,500 lbf. Is this a valid result and what does it mean?

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.

New Partnership Provides XFdtd Users an Hourly Licensing Option on Rescale's ScaleX Platform

Rescale and Remcom Bring GPU-Accelerated Electromagnetic Simulation to the Cloud

SAN FRANCISCO, CA — May 1, 2018 —

Rescale and Remcom are pleased to announce that XFdtd®, Remcom's electromagnetic (EM) simulation software, is now available on Rescale's ScaleX platform for HPC in the cloud, allowing engineers to quickly and easily run complex, high-fidelity EM simulation models from any web browser.

XFdtd is a finite-difference time-domain (FDTD) EM solver that is capable of handling large simulations with a minimal amount of RAM and processing them quickly using NVIDIA graphics processing units (GPUs). The partnership brings XFdtd's capabilities to the Rescale cloud platform, giving engineers pay-as-you-go access to Rescale's global multi-cloud HPC network of over 100 data centers worldwide. High-capacity users can scale out to thousands of cores and choose hardware configurations optimized to the requirements of XFdtd, with options ranging from economical HPC configurations to cutting-edge bare metal systems, low-latency InfiniBand interconnect, and the latest NVIDIA® Tesla® GPU accelerators. The partnership delivers the combined advantage of GPU acceleration and virtually unlimited scaling to EM applications such as automotive radar, biomedical, mobile devices, 5G MIMO and more.

Michael Hicks, Director of Business Development for Remcom, said of the partnership, "Remcom has been a pioneer in leveraging high-performance computing to greatly speed EM simulations, offering one of the first GPU-accelerated solutions in the EM software market. By utilizing Rescale's cloud platform for HPC, our customers will enjoy instant access to NVIDIA's state-of-the-art GPUs, driving development times down even further. This is yet another way we are helping customers to save time and money and deliver their products to market faster."

"We are very excited to be partnering with Remcom," said Joris Poort, CEO at Rescale. "We believe that Remcom users will benefit from the fast, flexible, secure, and huge on-demand resources that Rescale can bring to computationally demanding tools, such as electromagnetic simulation."

"NVIDIA has proven experience accelerating EM simulations, one of the fastest growing domains in the industry," said Baskar Rajagopalan, senior strategic alliances and marketing manager at NVIDIA.

"Rescale users will now be able to benefit from NVIDIA GPUs in the cloud to achieve faster and more accurate results from computationally intensive workloads."

About Remcom: Remcom provides innovative electromagnetic simulation and wireless propagation software for commercial users and U.S. government sponsors. Remcom's products are designed to work together to provide complete and accurate results when analyzing antenna propagation with complex devices in real world scenarios. Remcom's products simplify EM analysis for a wide variety of applications including antenna design and placement, 5G MIMO, outdoor and indoor mmWave planning, mobile device design, biomedical, microwave, automotive radar, and more. Remcom is committed to its customers' unique needs, offering flexible licensing options for installations of all sizes as well as custom engineered solutions. Visit www.remcom.com for more information.

About Rescale: Rescale is the global leader for enterprise big compute. Trusted by the Global Fortune 500, Rescale empowers the world's top executives, IT leaders, engineers, and scientists to securely manage product innovation and perform groundbreaking research and development faster at a lower cost. Rescale's ScaleX® platform solutions transform traditional fixed IT resources into flexible hybrid, private, and public cloud resources—built on the largest and most powerful high performance computing infrastructure network in the world. Rescale offers hundreds of turnkey software applications on the platform which are instantly cloud enabled for the enterprise. For more information on Rescale, visit www.rescale.com.

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.

CAE consulting - Software selection, CAE software sale & customer support , initial launch-up support, periodic on-site support

Engineering Services - Timely solutions, rapid problem set up, expert analysis - all with our Engineering Services. Terrabyte can provide you with a complete solution to your problem; can provide you all the tools for you to obtain the solution, or offer any intermediate level of support and software.

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

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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 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, 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.

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

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

Courtesy and copyright belongs to the website www.koenigsegg.com/agera-r/

Agera R model www.koenigsegg.com/agera-r/

On August 12, 1994, a 22-year-old Christian von Koenigsegg decided to follow his dream and build the world's greatest super-sports car. Koenigsegg Automotive is born.

Today the Agera R has a top speed of over 273 mph

The Agera R built upon the features and functionality of the Agera with new, unique solutions to enhance both performance and visual appearance even further.

Enhancements included: visible carbon on the front bonnet and bumper, new front side winglets, an all-new Aero exhaust, increased engine power with a raised RPM limit.

Koenigsegg was the first Hypercar manufacturer to take steps toward green technology with the release of the biofuel CCXR in 2007. The Agera R, based on the critically acclaimed Agera, follows in the footsteps of the CCXR as it also runs on biofuel.

The Agera R has an upgraded fuel and engine management system that allows it to run between 95 Octane and E100 biofuel, or any mix in between. The engine management system senses the fuel mixture and can adjust the engine's operation 'on the fly'.

The Agera R's fuel system has enough flow capacity to generate 1140hp and 1200Nm of torque on E85 and E100 biofuel. As there is less energy content per given volume in these biofuels compared to normal petrol, the fuel system has to manage a flow that is similar to a 2000hp petrol engine, which means that the Agera R's return-less fuel system had the highest capacity of any car in production at the time.

The Agera R also saw the debut of Koenigsegg's own ceramic piston brake system.

Courtesy of www.af.mil/About-Us/Fact-Sheets/Display/Article/104500/b-1b-lancer/

B-1B Lancer

Carrying the largest conventional payload of both guided and unguided weapons in the Air Force inventory, the multi-mission B-1 is the backbone of America's long-range bomber force.

Features: The B-1B's blended wing/body configuration, variable-geometry wings and turbofan afterburning engines, combine to provide long range, maneuverability and high speed while enhancing survivability. Forward wing settings are used for takeoff, landings, air refueling and in some high-altitude weapons employment scenarios. Aft wing sweep settings - the main combat configuration -- are typically used during high subsonic and supersonic flight, enhancing the B-1B's maneuverability in the low- and high-altitude regimes. The B-1B's speed and superior handling characteristics allow it to seamlessly integrate in mixed force packages. These capabilities, when combined with its substantial payload, excellent radar targeting system, long loiter time and survivability, make the B-1B a key element of any joint/composite strike force.

The B-1 is a highly versatile, multi-mission weapon system. The B-1B's synthetic aperture radar is capable of tracking, targeting and engaging moving vehicles as well as self-targeting and terrain-following modes. In addition, an extremely accurate Global Positioning System-aided Inertial Navigation System enables aircrews to navigate without the aid of ground-based navigation aids as well as engage targets with a high level of precision. The addition of a fully integrated data link (FIDL) with Link-16 capability provides improved battlefield situation awareness and secure beyond line of sight reach back connectivity. In a time sensitive targeting environment, the aircrew can use targeting data received from the Combined Air Operations Center or other command and control assets to strike emerging targets rapidly and efficiently.

The B-1B's onboard self-protection electronic jamming equipment, radar warning receiver (ALQ-161) and expendable countermeasures (chaff and flare) system and a towed decoy system (ALE-50) complements its low-radar cross-section to form an integrated, robust defense system that supports penetration of hostile airspace. The ALQ-161 electronic countermeasures system detects and identifies the full spectrum of adversary threat emitters then applies the appropriate jamming technique either automatically or through operator inputs

.

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** **www.complx.com.mx** /	Armando Toledo armando.toledo@complx.com.mx		
	LS-DYNA LS-OPT	LS-PrePost LS-TAsc Barrier/Dummy Models		
United States	**DYNAMAX** www.dynamax-inc.com	sales@dynamax-inc.com		
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models		LSTC Barrier Models	
United States	**Livermore Software Technology Corp** sales@lstc.com **LSTC** www.lstc.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	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

QuikCAST	SYSWELD	PAM-COMPOSITES	CEM One
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	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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France	**DYNAmore France SAS**		sales@dynamore.eu	
	www.dynamore.eu			
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	DSDM Products		LSTC Dummy Models	FEMZIP
	LSTC Barrier Models		DIGIMAT	

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	www.cadfem.de			
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		AnyBody		
	ANSYS/LS-DYNA			

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	REPORTER	SHELL	FEMZIP	HYCRASH	
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	DIGIMAT	FEMZIP	LSTC Barrier Models	LS-TaSC
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	JSTAMP/NV	Scan IP	Scan FE	Scan CAD
	FEMZIP			

Korea	**KOSTECH**	young@kostech.co.kr		
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	eta/DYNAFORM	DIGIMAT	Simuform	Simpack
	AxStream	TrueGrid	FEMZIP	

Taiwan **AgileSim Technology Corp.**

www.agilesim.com.tw

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Taiwan **Flotrend**

www.flotrend.com.tw

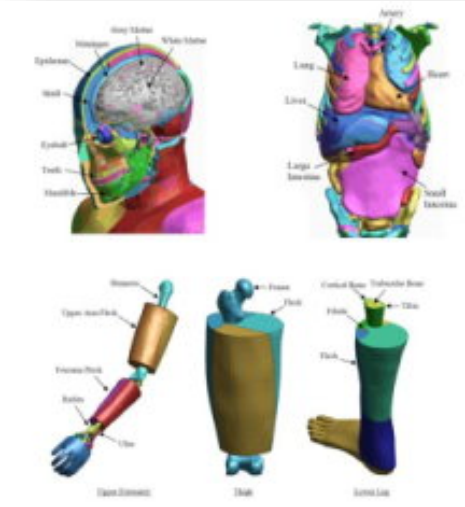
LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Taiwan **SiMWARE Inc..**

www.simware.com.tw

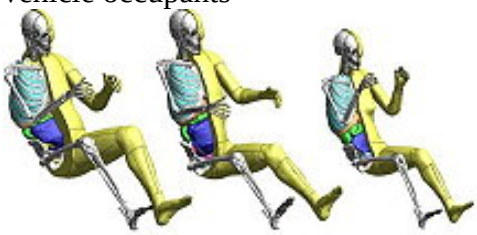
LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

TOYOTA - Total Human Model for Safety – THUMS

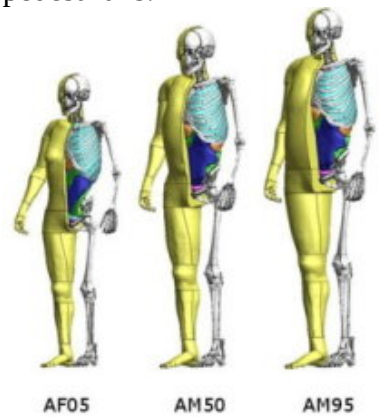


The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons, 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

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..

Registration/Classes: www.ls-dynaconferences.com

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Webinars

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Directory

Arup	www.oasys-software.com/dyna/en/training
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Training - Dynamore

Author: Christian Frech christian.frech@dynamore.de

New seminar brochure 2018

Visit the website for complete overview and registration www.dynamore.de/seminars

Download full seminar brochure (pdf): www.dynamore.de/seminarbroschure2018

Seminars	Jun 18	Jul 18	Sep 18	Oct 18	Nov 18	Dec 18
Introduction to LS-DYNA F. Andrade, T. Graf, S. Mattern	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		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

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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Editor: Yanhua Zhao - yanhua@feainformation.com

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

Table 1 Paper 1-11 ***On Mesh Fusion Scheme in LS-DYNA®***
Ninshu Ma, Osaka Univ
Houfu Fan & Xinhai Zhu, LSTC

Abstract - In this paper, the limitation of the original mesh fusion method in LS-DYNA® is discussed. A new mesh fusion scheme is proposed and implemented in LS-DYNA. It is shown through a numerical example that the original method could sometimes fail in predicting the shell thickness distribution, while the proposed scheme is able to do so.

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** J. Zheng, X. Zhu and H. Fan
1-9 Improve time step size sensitivity in transient mechanical simulations J. Zheng and X. Zhu	**1-10 Introducing *BOUNDARY_SPC_SYMMETRY_PLANE (SET)** X. Zhu, Li Zhang, and Y. Xiao

Editor: Yanhua Zhao - yanhua@feainformation.com

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

Table 2: New Feature 2-13

Scalability study of particle method with dynamic load balancing in LS-DYNA®

Hailong Teng - LSTC

Abstract: We introduce an efficient load-balancing algorithm for particle blast method (PBM). Load-balancing is achieved by dynamically adaptively using RCB to evenly distribute workload to processors. Numerical tests demonstrated that with reformulated parallel scheme, the speedup for an airblast problem can be 20~30 times or more when using 128~192 cores.

Among the Previous Months Postings on New Features Table 2

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

Highlights from the upcoming 15th International LS-DYNA Conference.

Full Agenda is located at www.ls-dynaconferences.com

"The Isogeometric Approach to Analysis" Prof. Thomas J.R. Hughes, , University of Texas
"Application of Reduced Model to Simulations of Occupant Protection and Crashworthiness at Toyota" Dr. Tsuyoshi Yasuki, Project General Manager, Advanced CAE Division, Toyota Motor Corporation
"ACP OpDesign: Optimal Design Gateway " Akbar Farahani, Engineering Technology Associates, Inc. (ETA)
"LSTC-ANSYS: A winning Partnership" Dale Ostergaard, ANSYS
"Advances in Linear Algebra Technology and the Impact on Applications Using LS-DYNA®" Roger Grimes, LSTC
"Experience with Material and Fracture Modeling at Fiat Chrysler Automobiles (FCA)" Paul Du Bois, Consultant Dr. Anantharam Sheshadri, FCA
"Integrated Computational Materials Engineering (ICME) for Carbon Fiber Composites" Dr. Danielle Zeng, Ford Motor Company
"Modeling & Simulation Challenges at the Interface Between Man and Machine: Medical Devices" Dr. Mark Palmer, Medtronic
"The New Features in LS-PrePost 4.5 and the Direction of its Future Development" Philip Ho, LSTC

Papers Not To Miss:

- **Cloud-based Pedestrian Protection App - Seshadri, M. (ESI Group)**
- **Simulation of the Performance of Passenger Rail Vehicles under Blast Conditions in LS-DYNA® - Lancelot, F. (Arup)**
- **Constitutive Modeling of Biological Soft Tissues - Benson, D. (LSTC)**
- **Cardiac Electrophysiology using LS-DYNA® - L'Eplattenier, P. (LSTC)**
- **Calculation of the Velocity and Shape of an Explosively Formed Projectile (EFP) Using Axisymmetric ALE - Puryear, J. (ABS Group)**
- **Simulation and Testing Assessment of Cruciform Parachutes using LS-DYNA® ALE - Rose, T. (US. Army Natick Soldier Research)**
- **Impact Test Simulation for Nuclear Power Plant Safety under Tornado Disaster - Tokura, S. (Tokura Simulation Research)**

Highlights from the upcoming 15th International LS-DYNA Conference.

- **The Role of LS-DYNA® in the Design of the New London Electric Taxi - Dennis, J. (Arup, Advanced Technology and Research)**
- **Model Set up, Analysis and Results of the Inverse Forming tool in ANSA - Iordanidou, E. (BETA CAE Systems SA)**
- **Probabilistic Penetration Response - Nilakantan, G. (Teledyne Scientific & Imaging)**
- **Developing a Numerical Model for Human Brain under Blast Loading - Yucesoy, A. (Michigan State University)**
- **Sensitivity, Model Prediction with Data Derived From Coupon Tests - Yates, K. (Virginia Tech)**
- **FSI Simulation of a Double-deck Bus Cornering under Crosswind Effects - Paz, R. (LSTC)**
- **Li-Ion Battery Modeling Strategies for Electric Vehicle Crash Applications - Seulin, M. (DynaS+)**

Closing Plenary Presentation

Session Chair: Nathan Hallquist, LSTC

"Recent and Ongoing Developments in LS-DYNA®"

LSTC Developers:

John O. Hallquist	Thomas Borrvall	Facundo Del Pin
Jason Wang	Cheng-Tang Wu	Pierre L'Eplattenier
Xinhai Zhu	David Benson	Isheng Yeh
John Zhao	Nielen Stander	

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