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   Cray Helps Save Rabbits

FEA Information Inc. is a publishing company founded April 2000, incorporated in the State of California July 2000, and first published October 2000. The initial publication, FEA Information News continues today as FEA Information Engineering Solutions. The publication's aim and scope is to continue publishing technical solutions and information, for the engineering community.

FEA Information Inc. Publishes:

> FEA Information Engineering Solutions
>
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> FEA Information China Engineering Solutions

FEA Information Engineering Solutions:

> A monthly publication in pdf format sent via e-mail, additionally archived on the website FEA Publications. www.feapublications.com

FEA Information China Engineering Solutions

> The first edition was published February 2012. It is published in Simplified and Traditional Chinese in pdf format. Published : February, April, June, August, October, December. The China Solutions is archived on the website FEA Publications. www.feapublications.com
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> Available on www.feaiej.com

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gns
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www.lstc.com

Oasys
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kaizenat.com

DFE-TECH
www.dfe-tech.com

LANCEMORE Co.
www.lancemore.jp/index_en.html

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        E-learning - New Courses – One Day Seminars.

LSTC New One Day Seminars - $100   Students $50

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- 04/12   Modeling Warm Forming & Hot Stamping
- 04/16   ICFD and FSI
- 04/17   ICFD and Conjugate
- 04/18   Electromagnetism

CA Office
- 05/15   ICFD and FSI
- 05/16   ICFD and Conjugate
- 05/17   Electromagnetism

Dr. Ala Tabiei announces his new website and on line courses
WWW.LSDYNA-ONLINE.COM

Explosives Modeling For Engineers
New LS-DYNA Course
by Paul Du Bois & Len Schwer
Schedule of future classes and pricing :
www.duboisschwertraining.com

FEA Information Engineering Journal has posted Submission Guidelines. Additionally, they are listed on the last pages of this publication.
www.feaiej.com

Sincerely, Marsha Victory,
Trent Eggleston FEA Information

μETA Post-Processor Toolbars for Crash and Safety

Introduction

The ever-increasing workload and demand to meet strict deadlines has necessitated the automation of modern CAE software. Experience has proven that particularly for crash and safety analyses which can involve hundreds of different runs, the processing of these runs' results and the subsequent generation of a complete report is a very tedious and time-consuming task. Thus, introducing, in this part of the design cycle, software with advanced automation capabilities can have a significant impact on reducing the lead times.

Automation Capabilities in μETA

μETA covers the above requirements through an array of advanced automation capabilities which include:
-       BETA scripts,
-       μETA session files
-       User Toolbars

BETA scripts are text codes based on the C programming language which allow for unparalleled model data gathering and process automation.

μETA session files are text files. They are a sequence of μETA-commands that can be parameterized and executed silently to perform repetitive and time-consuming processes without manual intervention.

User toolbars are custom graphical user interfaces created within μETA, using the dedicated Toolbar Designer. Taking advantage of the automation capabilities of both BETA scripts and μETA sessions, user toolbars can be created as discipline and process-specific to contain only the necessary functions. Additionally, they can be shared between different work-teams.

μETA toolbars

Available with every μETA Post installation, an assortment of default user toolbars can also be accessed by any user of μETA. Particularly, for LS-Dyna and LS-Opt, the user toolbars that exist are the following.

Pedestrian
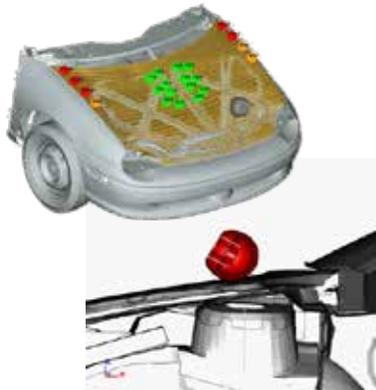
- Headform, legform and upper leg testing

- Custom settings for plots, videos and criteria limits

- User-defined and default fringebars (EuroNCAP grid colors, etc)

- Overview through annotations and mapping of values on the model

- Videos of model clipped by planes or of model sections

- EuroNCAP score calculation

- Automatic pptx/html report creation even in batch mode

- Use of pptx master slide and custom slide layouts

IIHS
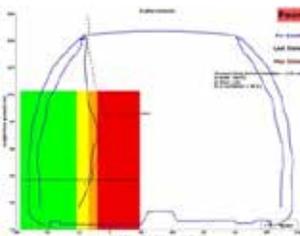
- Front Impact : measurement of intrusion into occupant compartment
- Side Impact : measurement of intrusion into occupant compartment around the B-pillar
- Roof Impact : strength-to-weight ratio plot

FMVSS_201U
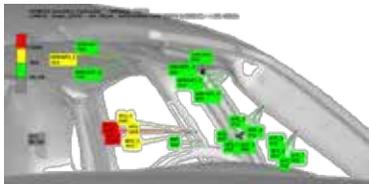
- Automatic creation of pptx report
- 2d plots with HIC value / acceleration to intrusion
- Video animation of the impact

BusRollover

- Calculations according to regulation ECE R66
- Easy definition of the sections where the intrusion will be measured
- Automatic calculation of the intrusion in the survival space at each section

OptimizerSetup

- Helps integrate μETA in optimization loops
- Successful integration to the LS-Opt, Optimus and ModeFrontier codes
- All necessary settings within a single interface, so it is easy for inexperienced users to quickly set-up the process
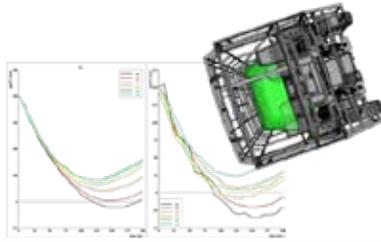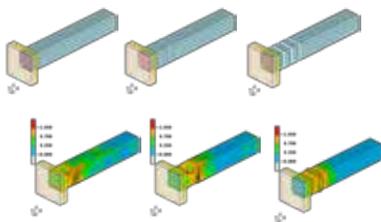- Design responses and histories can be output in a standard format file

Collision-Penetration Check

- Calculation and visualization of penetrating areas between different models or within the same model
- Penetration on element intersections or on property-thickness level
- Automatic creation of separate penetrating element groups for each state

Benefits:

User toolbars offer:

- Process automation
- Guidance in performing tasks in a fail-safe, step by step manner
- Customization ability to suit any user or process requirement

The default toolbars, available with μETA, have been developed with the close collaboration and supervision of major OEMs, so their regulation conformance is guaranteed and their advantages in boosting productivity proven through real-life situations.

For more information contact: BETA CAE Systems S.A.
   Email: ansa@beta-cae.gr

Cost Effective Solutions - If you wish Lancemore to create a particular model, please contact info@lancemore.jp.

English: http://www.lancemore.jp/index_en.html
Japanese: http://www.lancemore.jp/index.html

Among the LS-DYNA Analysis Models Added in February:

No.319

www.lancemore.jp/ls-dyna/example_319.html
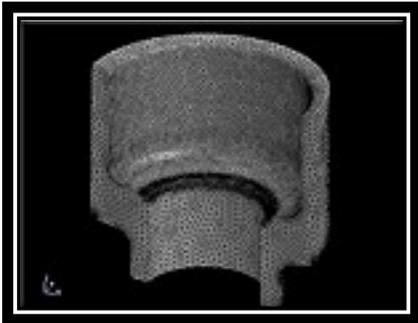
3D Forging Analysis using R-Adaptive Remesh with Local Refine

No.318

www.lancemore.jp/ls-dyna/example_318.html
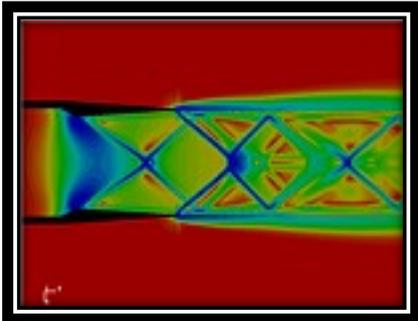
CESE Shock Diamonds Analysis

No.317

www.lancemore.jp/ls-dyna/example_317.html
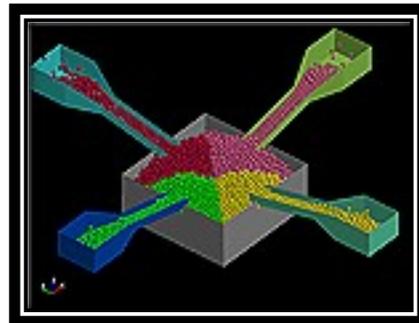
DES Injection Analysis

No.316

www.lancemore.jp/ls-dyna/example_316.html
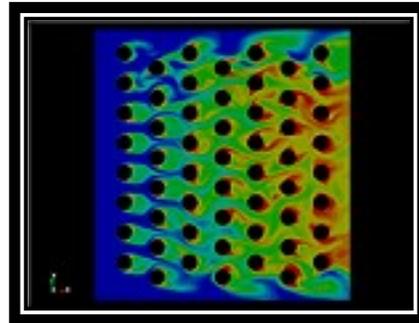
ICFD Heat Exchanger Analysis

Asst. Prof. Dr. Paul W. Bland

The Thai-German Graduate School of Engineering (TGGS) was established in Bangkok in 2001, as a partnership between RWTH-Aachen University (Germany) and King Mongkut's University of Technology North Bangkok (Thailand).
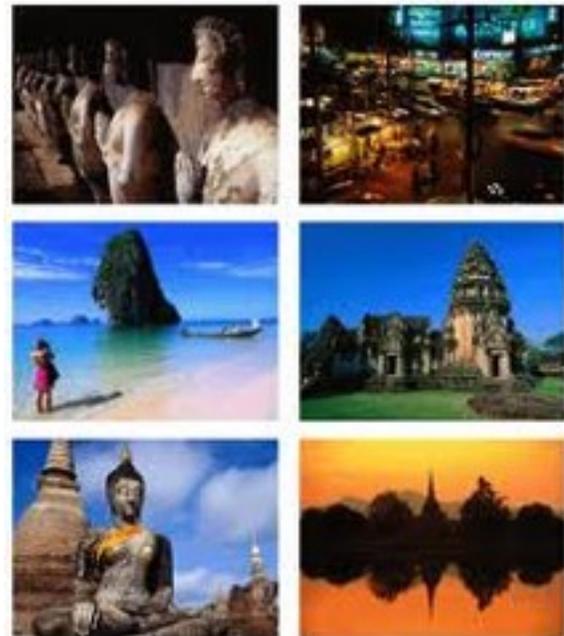
The Structural Dynamics Lab (SDL) within the Mechanical Engineering Simulation & Design (MES&D) Group at TGGS is offering the opportunity for research laboratory based visits with Dr Paul Bland, for 3-12 months, although stays of 6 months or more are recommended to get the most out of the intercultural experience.

The core project content would revolve around the use of LS-DYNA, and be integrated into an ongoing larger project with several people, with your scope detail to be finally fixed just prior to any final commitment, being well defined and documented as one of the necessary conditions of approval.

We are designing and building a "Light Gas Gun" to fire projectiles at solid targets, equipped with an array of sensors including laser displacement, accelerometers, force, acoustic emission, and projectile motion detection. The core project content for visiting personnel, might include adaptive meshing, damage modeling, development of post-processing tools such as time-frequency domain "waterfall plot" of selected data types, simulation of the whole impact event, comparison measurement results – all in the context of the SDL group latest research into impact mechanics, which has the overarching goal of linking between the micro and macro scales.

The project could be packaged in the form of "for credit" internship, thesis or other formal frameworks, pending approval of your home University, principally by contact with a formal supervisor.

We follow international standards for engineering education, project management and supervision, in a multi-cultural environment, and our location provides an enriching intercultural experience.

Support would be given, in terms of finding suitable accommodation, visa and other administrative processes, as well as orientation and day to day living, cultural "do's and dont's" and friendly contact for local knowledge primarily facilitated by contact with other international students, the University

International Affairs Office, TGGS admin staff, SDL RA's and Paul.

Applicants must have strong proven experience with LS-DYNA, would ideally be from a Mechanical Engineering Masters or PhD level, be of good academic standing and have excellent English language skills. Exceptional UG final year or recent graduates may be considered, especially if they have strong direct technical experience.

Interested persons should contact Dr Paul Bland (bland.p.mesd@tggs-bangkok.org), sending a CV with key initial information such as your possible timeline, indicating your fit to the outline project.

(RHDV), causes a highly infectious and often fatal illness in domestic and wild rabbits
.

This is important to me, Marsha Victory, since I love my pet rabbits

left: Sir Barcode
        right: Lady Heidi Spot

U.S./China team determines structure of virus with Blue Waters
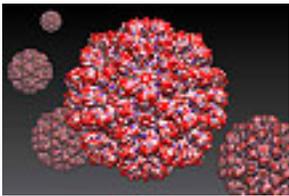
The atomic model of rabbit hemorrhagic disease virus capsid, courtesy Yanxin Liu and Klaus Schulten, Beckman Institute, University of Illinois at Urbana-Champaign; Fei Sun, Institute of Biophysics, Chinese Academy of Sciences.

Simulations carried out using the Blue Waters petascale supercomputer have determined the structure of the rabbit hemorrhagic disease virus (RHDV), which causes a highly infectious and often fatal illness in domestic and wild rabbits.

This research, carried out collaboratively by researchers at the University of Illinois, the University of California-San Diego and several Chinese research institutions, has been published in PLOS Pathogens.

RHDV belong to the Lagovirus genus, and the detailed structure of any lagovirus has yet to be determined. The study published in PLOS Pathogens used a cryo-electron microscopic reconstruction of wild-type RHDV and the crystal structures of two domains of its capsid, the protein structure that encases the virus' genetic material. These data were used to build a complete atomic model of the RHDV capsid. According to the researchers, this "provides a reliable, pseudo-atomic model of a Lagovirus and suggests a new candidate for an efficient vaccine that can be used to protect rabbits from RHDV infection."

University of Illinois biophysicist Klaus Schulten, a co-author of the published study, says the computational power of Blue Waters and the NAMD molecular dynamics code developed at the University of Illinois were vital to achieving this result.

"The structure of the capsid of RHDV could only be achieved through a 9,891,665-atom NAMD simulation. The computational strategy adopted would have been inconceivable before the advent of Blue Waters due to the needed large simulation size," he said. "This study demonstrates clearly that Blue Waters is a research instrument for mainstream life science!"

Schulten received a Petascale Computing Resource Allocation from the National Science Foundation that enabled his research team to prepare NAMD for extreme-scale supercomputers and to tap into the computing and data power of Blue Waters. His group is currently using Blue Waters to conduct a 24 million-atom simulation of a photosynthetic membrane that harvests sunlight and a 65 million-atom simulation of another capsid, this time the protein capsule that encases HIV.

For more information about how Blue Waters is used for a wide range of science and engineering research by investigators across the country, visit

http://www.ncsa.illinois.edu/BlueWaters/ .

www.dfe-tech.com

Introducing LS-DYNA® 16-core Node Locked SMP version for PC/Windows workstation in Thailand, Singapore, Malaysia

Jenson Chen, *DFETECH*

Noi Sims, *LSTC*

DYNA FORMING ENGINEERING & TECHNOLOGY SDN. BHD. (DFETECH)
  LSTC's Direct Distributor

LS-DYNA® 16-core Node Locked SMP version for PC/Windows workstation

- **40% price discount from network server version (does not include MPP)**
- For single user workstation
- LS-Prepost®(pre-post processing)
- LS-OPT®(parametric optimization)
- LS-TaSC® (shape and topology optimization)
- LSTC dummies and barriers
- New CFD and Electro-magnetism features (version R7 and above)

Additionally introduction of:

- LS-DYNA's newest metal forming features
- Warm forming and hot stamping,
- University collaboration opportunities.

The LS-DYNA solver works seamlessly with many pre-post processing software. DFETECH will provide LS-DYNA, as the solver, for PrePost Processors distributed through other companies.

LS-DYNA is provided at a published price list, to ensure you are delivered LSTC's full version capabilities and applications and not a subset of the solver. The price list is directly from LSTC, the developer of LS-DYNA.

Email: sales@dfe-tech.com
URL: www.dfe-tech.com

THUMS™ (Total Human Model for Safety) for safety research

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.

Model Details

The latest Version of the THUMS model is Version 4.

Three different sizes of the model are available:

•Adult female 5th percentile
•Adult male 50th percentile
•Adult male 95th percentile
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.
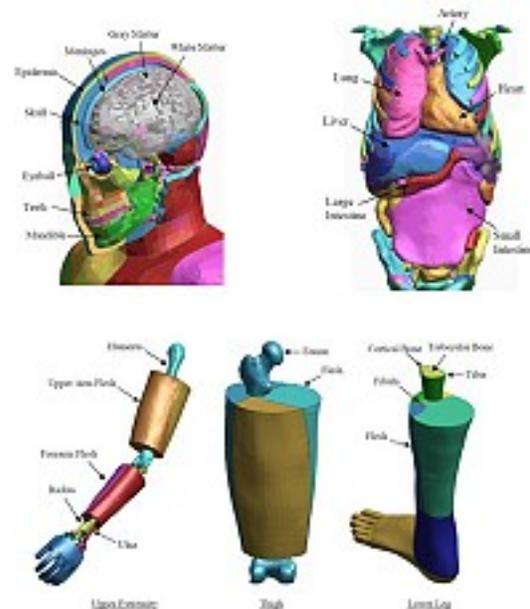
THUMS® is registered trademark of Toyota Motor Corporation

DYNA FORMING ENGINEERING & TECHNOLOGY SDN. BHD. (DFETECH)
101 Jalan Pendamar 27/90
Taman Alam Megah, Syeksyen 27
40400 Shah Alam,
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Tel: +603 5198 0121, +6016-600-9966 (Ryu)
Fax: +603 5198
Email: sales@dfe-tech.com
URL: www.dfe-tech.com

For Complete Information Visit www.gompute.com/gompute-on-demand

Comprehensive HPC
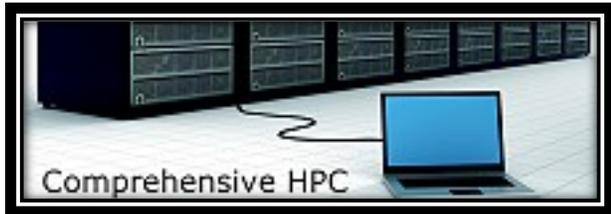
Gompute on Demand delivers HPC as a service.

Gompute On Demand provides customers with a turnkey environment backed by specialized support to solve computationally intensive workloads .

Security: Gompute on Demand is provided in the form of a private Linux cluster with a private internal network and file system.

The service is capable of complying with the customer's security policies in terms of user identification, data security and system access by using various techniques, e.g. dual factor identification, data encryption, VPN based communication etc.

Gompute owns and operates its own infrastructure and datacenter making it capable of delivering secure solutions to European and American organizations, including government institutions.

Purchasing computing power: Gompute on Demand offers subscription to a private cluster with an HPC environment compatible with the chosen security policy. Users and departments can be organized as needed and seamlessly combined with the application environment tailored to the customer's needs.

Computing resources are added to this private cluster as reserved nodes and/or extra storage. Last minute and advanced reservations are also possible.

**Virtual organizations:** Gompute supports creation of departmental user groups who share the same resources. Customers may partition their contracted resources in departments to enable separate resource access and accounting of the HPC system or license usage.

Users have the possibility to share their data through private model repositories and collaborate using Gompute's Remote Desktop technology.

Remote Visualization & Collaboration:

Gompute on Demand is powered by Gompute's cutting edge technology for remote visualization, letting users access their applications with its original GUI.

Gompute on Demand's remote visualization improves productivity by providing effective collaboration between geograpically distributed teams in different continents.

Team members or third party support personnel can share desktops helping in quick decision making and cutting costs.

http://www.dynasupport.com/

At this site you will find answers to basic and advanced questions that might occur while using LS-DYNA. Furthermore it will provide information about new releases and ongoing developments. The content will be regularly updated with answers to frequent questions related to LS-DYNA.

Among the recent updates - please visit the site for the pdf files.

February

- Total energy

- History Variables for Certain Material Models

January
- Upgrade a Network License (Linux/Unix/Solaris)

- LS-DYNA V971 R6.1.1 (R6.78769) released

BETA CAE Systems S.A.   www.beta-cae.gr

BETA CAE Systems S.A.– ANSA

Is 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 S.A.– 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	Participant	Solutions

CRAY

http://www.cray.com/Products/Products.aspx

www.cray.com

The Cray XK6

The Cray XK6 supercomputer combines Cray's proven Gemini interconnect, AMD's leading multi-core scalar processors and NVIDIA's powerful many-core GPU processors to create a true, productive, hybrid supercomputer

Cray XE6™ and Cray XE6m™ Supercomputers

The Cray XE6 scalable supercomputer is engineered to meet the demanding needs of capability-class HPC applications. The Cray XE6m is optimized to support scalable workloads in the midrange market.

Cray XMT™ System YarcData uRiKA™ Graph Appliance

The YarcData uRiKA graph appliance is a purpose built solution for Big Data

relationship analytics. uRiKA enables enterprises to discover unknown and hidden relationships in Big Data, perform real-time analytics on Big Data graph problems, and realize rapid time to value on Big Data solutions.

The uRiKA graph appliance complements an existing data warehouse or Hadoop cluster.

Cray Sonexion 1300™ Storage System

The Cray Sonexion 1300 system is an integrated, high performance storage system that features next-generation modular technology to maximize the performance and capacity scaling capabilities of the Lustre file system.

Cray also offers custom and third-party storage and data management solutions

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
etainfo@eta.com

www.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

ESI Group www.esi-group.com

Visual-Environment: Visual-Environment is an integrated suite of solutions which operate either concurrently or standalone within a common environment. It aims at delivering an open collaborative engineering framework. As such, it is constantly evolving to address various disciplines and available solvers.

Visual-Crash is a dedicated environment for crash simulation: It helps engineers get their job done in the smoothest and fastest possible way by offering an intuitive windows-based graphical interface with customizable toolbars and complete session support.

For LS-DYNA users, Visual-Crash DYNA allows to focus and rely on high quality digital models, from start to finish as it addresses the coupling with competitive finite element or rigid body based software. This very open and versatile environment simplifies the work of CAE engineers across the enterprise by facilitating collaboration and data sharing.

Further tools are integrated in Visual-Environment enhancing CAE engineers work tasks most efficiently.

Visual-Mesh generates 1D, 2D and 3D elements for any kind of simulation.
Visual-Mesh provides automatic and guided surfaces clean up, application specific mesh generation and intuitive post mesh editing features..

Visual-Viewer is a complete, productive and innovative post-processing environment for CAE applications.

Visual-Viewer delivers a dedicated plotting and animation control solution. It offers a multi page, multi plot environment, allowing to group data into pages and plots. It is designed with a Windows GUI based on an intuitive and sleek user interface.

Visual-Process Executive is an advanced CAE environment for process customization and automation.

VisualDSS is an End-to-End Decision Support System for CAE. Manufacturers widely resort to Simulation-Based Design to gain a competitive edge in product development.

GNS - Gesellschaft für Numerische Simulation mbH   www.gns-mbh.com

Animator4

A general finite element post-processor and holds a leading position in its field. Animator4 is used worldwide by almost all automotive companies, a great number of aerospace companies, and within the chemical industry.

Generator2.

A specialized pre-processor for crashworthiness applications and has become very successful in the field of passenger safety and pedestrian protection. It is mainly used as a positioning tool for finite element component models by a great number of automobile companies throughout the world.

Indeed

An easy-to-use, highly accurate virtual manufacturing software that specializes in the simulation of sheet metal forming processes. Indeed is part of the GNS software suite and works concurrently with all other GNS software products.

OpenForm

A pre- and post-processor independently of a particular finite element forming simulation package. The software is extremely easy to handle and can be used as was designed to enable those who are not finite element experts to carry out multi-stage forming simulations with even complex multi purpose finite element codes.

Gompute on demand®/ Gridcore AB Sweden
www.gompute.com   www.gridcore.se

Gompute is owned, developed and operated by Gridcore AB in Sweden. Founded in 2002, Gridcore is active in three areas: Systems Integration, Research & Development and HPC as a service.

Gridcore has wide experience of different industries and applications, developed a stable product portfolio to simplify an engineer/scientist's use of computers, and has established a large network of partners and collaborations, where we together solve the most demanding computing tasks for our customers. Gridcore has offices in Gothenburg

.

(Sweden), Stuttgart (Germany), Durham NC (USA) and sales operations in The Netherlands and Norway.

The Gridcore developed E-Gompute software for internal HPC resources gives end users (the engineers) an easy-to-use and complete environment when using HPC resources in their daily work, and enables collaboration, advanced application integrations, remote pre/post, accounting/billing of multiple teams, license tracking, and more, accelerating our customers usage of virtual prototyping

JSOL Corporation

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.

Oasys, Ltd

Oasys LS-DYNA® Environment

The Oasys Suite of software, exclusively written for LS-DYNA®, is at the leading edge of the market and is used worldwide by many of the largest LS-DYNA® customers.

Oasys PRIMER is a model preparation tool that is fully compatible with the latest version of LS-DYNA®, eliminating the risk of data loss or corruption when a file is manipulated, no matter what operations are performed on it:

Key benefits:

- Maintains data integrity
- Finds and fixes model errors (currently over 5000 checks)
- Specialist tools for dummy positioning, seatbelt fitting, mechanisms, interior head impact etc.
- Connection manager for spotwelds, bolts, adhesive etc.
- Intelligent editing, deletion and merging of data
- Customisable with macros and JavaScript.

Oasys D3PLOT is a powerful 3D visualization package for post-processing LS-DYNA® analyses

Key benefits:

- Fast, high quality graphics
- Easy, in-depth access to all LS-DYNA® results.
- User defined data components
- Customisable with JavaScript.

Oasys T/HIS is an X-Y graph plotting package for LS-DYNA®

Key benefits:

1. Automatically reads all LS-DYNA® results.
2. Wide range of functions and injury criteria.
3. Easy handling of data from multiple models
4. Scriptable for automatic post-processing

Oasys REPORTER is an automatic report generation tool, for use with LS-DYNA®. which allows fast automatic report creation for analyses.

Solutions	Participant	Solutions

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, Hengstar Technology will continue to organize high level training courses and seminars in 2012.

The lectures/training are taught by senior engineers and experts mainly from LSTC, Carhs, OEMs, and other consulting groups.

On Site Training

Hengstar also provides customer customized training programs on-site at the company facility.

Training is tailored for company needs using LS-DYNA or the additional software products by LSTC.

Distribution & Support

Hengstar Distributes and supports LS-DYNA, LS-OPT, LS-PrePost, LS-TaSC. Hongsheng Lu, previously was directly employed by LSTC before opening his distributorship in China for LSTC software.

Hongsheng travels to LSTC often to keep current on the latest software features and support to continue to grow Hengstar as a CAE consulting group.

Distribution & Consulting	North America	Distribution & Consulting

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		
United States	**CAE Associates Inc.** www.caeai.com	info@caeai.com	
	ANSYS Products	CivilFem	Consulting ANSYS
			Consulting LS-DYNA
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	**ESI-Group N.A**			
	www.esi-group.com			
	QuikCAST	SYSWELD	PAM-RTM	PAM-CEM
	VA One	CFD-ACE+	ProCAST Process	Visual-
	VisualDSS	Weld Planner	Visual-Environment	IC.IDO

United States	**Engineering Technology Associates – ETA** www.eta.com	etainfo@eta.com		
	INVENTIUM/PreSy	NISA	VPG	LS-DYNA
	LS-OPT	DYNAform		

United States	**Gompute**	info@gompute.com	
	www.gompute.com		
	LS-DYNA Cloud Service	Additional software	
	Additional Services		

Distribution & Consulting	North America	Distribution & Consulting

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

United States	**Predictive Engineering** www.predictiveengineering.com	george.laird@predictiveengineering.com
	FEMAP NX Nastran	LS-DYNA LS-OPT
	LS-PrePost LS-TaSC	LSTC Dummy Models
		LSTC Barrier Models

Distribution & Consulting	Europe		Distribution & Consulting

France   **DynAS+**   v.lapoujade@dynasplus.com

www.dynasplus.com

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
DYNAFORM	VPG	MEDINA	
LSTC Dummy Models		LSTC Barrier Models	

France   **ALYOTECH**   nima.edjtemai@alyotech.fr

www.alyotech.fr

ANSYS	LS-DYNA	MOLDEX3D	FEMZIP
Primer	PreSys	DYNAFORM	SKYGEN
MERCUDA	MOCEM		

Germany   **CADFEM GmbH**   lsdyna@cadfem.de

www.cadfem.de

ANSYS	LS-DYNA	optiSLang	DIGIMAT
ESAComp	AnyBody	VPS	
FTI FormingSuite			

Distribution & Consulting	Europe	Distribution & Consulting	

Germany **DYNAmore GmbH** uli.franz@dynamore.de

www.dynamore.de

PRIMER	LS-DYNA	FTSS	VisualDoc
LS-OPT	LS-PrePost	LS-TaSC	DYNAFORM
Primer	FEMZIP	GENESIS	
TOYOTA THUMS		LSTC Dummy & Barrier Models	

Germany **GNS** mbox@gns-mbh.com

www.gns-mbh.com

Animator	Generator	Indeed	OpenForm

The Netherlands **Infinite Simulation Systems B.V** j.mathijssen@infinite.nl

www.infinite.nl

ANSYS Products	CivilFem	CFX	Fluent
LS-DYNA	LS-PrePost	LS-OPT	LS-TaSC

Distribution & Consulting		Europe	Distribution & Consulting	

Italy **EnginSoft SpA** info@enginsoft.it

www.enginsoft.it

ANSYS	MAGMA	Flowmaster	FORGE
CADfix	LS-DYNA	Dynaform	Sculptor
ESAComp	AnyBody	FTI Software	
AdvantEdge	Straus7	LMS Virtual.Lab	ModeFRONTIER

Russia **STRELA** info@dynarussia.com

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

Sweden **DYNAmore Nordic** marcus.redhe@dynamore.se

www.dynamore.se

ANSA	μETA	LS-DYNA	LS-OPT
LS-PrePost	LS-TaSC	FastFORM	DYNAform
FormingSuite		LSTC Dummy Models	
		LSTC Barrier Models	

Sweden **GRIDCORE** info@gridcore.com

www.gridcore.se

LS-DYNA Cloud Service	Additional software

Distribution & Consulting		**Europe**		**Distribution & Consulting**	

Switzerland   **DYNAmoreSwiss GmbH**   info@dynamore.ch

www.dynamore.ch

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

UK   **Ove Arup & Partners**   dyna.sales@arup.com

www.oasys-software.com/dyna

LS-DYNA		LS-OPT	LS-PrePost
LS-TaSC	PRIMER	D3PLOT	T/HIS
REPORTER	SHELL	FEMZIP	HYCRASH
DIGIMAT	Simpleware	LSTC Dummy Models	
		LSTC Barrier Models	

Australia   **LEAP**

www.leapaust.com.au

ANSYS Mechanical	ANSYS CFD	ANSYS EKM	Recurdyn
ANSYS DesignXplorer	ANSYS HPC	FlowMaster	Ensigh
LS DYNA	DYNAform	Moldex 3D	FE-Safe

China   **ETA – China**   lma@eta.com.cn

www.eta.com/cn

Inventium	VPG	DYNAFORM	NISA
LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
		LSTC Barrier Models	LS-TaSC

China   **Oasys Ltd. China**   Stephen.zhao@arup.com

www.oasys-software.com/dyna

PRIMER	D3PLOT	HYCRASH	T/HIS	REPORTER	SHELL
LS-DYNA		LS-OPT	LSTC Dummy Models		LS-PrePost
DIGIMAT		FEMZIP	LSTC Barrier Models		LS-TaSC

China   **Shanghai Hengstar Technology**   info@hengstar.com

www.hengstar.com

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

India	**Oasys Ltd. India**		lavendra.singh@arup.com		
	www.oasys-software.com/dyna				
	PRIMER	D3PLOT	T/HIS		
		LS-OPT	LSTC Dummy Models	LS-PrePost	
		LS-DYNA	LSTC Barrier Models	LS-TaSC	

India	**EASI Engineering**		rvenkate@easi.com		
	www.easi.com				
	ANSA				
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost	
			LSTC Barrier Models	LS-TaSC	

India	**CADFEM Eng. Svce**		info@cadfem.in		
	www.cadfem.in				
	ANSYS	VPS	optiSLang	ESAComp	DIGIMAT
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost	
	FTI FormingSuite	AnyBody	LSTC Barrier Models	LS-TaSC	

India	**Kaizenat Technologies Pvt. Ltd**		support@kaizenat.com		
	http://kaizenat.com /				
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost	
	Dedicated to LSTC Software		LSTC Barrier Models	LS-TaSC	

Distribution & Consulting	Asia Pacific	Distribution & Consulting	

Japan   **ITOCHU**   LS-dyna@ctc-g.co.jp

www.engineering-eye.com

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

Japan   **JSOL**

www.jsol.co.jp/english/cae

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

Japan   **FUJITSU**

http://jp.fujitsu.com/solutions/hpc/app/lsdyna

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

Distribution & Consulting	Asia Pacific	Distribution & Consulting	

Korea   **THEME**   wschung@kornet.com

www.lsdyna.co.kr

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	Planets
eta/DYNAFORM	FormingSuite	Simblow	TrueGRID
JSTAMP/NV	Scan IP	Scan FE	Scan CAD
FEMZIP			

Korea   **KOSTECH**   young@kostech.co.kr

www.kostech.co.kr

LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM
eta/DYNAFORM	DIGIMAT	Simuform	Simpack
AxStream	TrueGrid	FEMZIP	

Distribution & Consulting	Asia Pacific	Distribution & Consulting	

Taiwan	**Flotrend**	gary@flotrend.tw		
	www.flotrend.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Taiwan	**APIC**			
	www.apic.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Germany	Gridcore	www.gridcore.se
Sweden	Gridcore	www.gridcore.se
United States	Gompute	www.gompute.com

The Complete Courses Offered Can Be Found At: www.cadfem.de

Please check the site for accuracy and changes. Among the many course offered:
2013 Listings:

Classroom-Seminar: Geometry modelling with ANSYS DesignModeler and basics of meshing

     02/12 - Grafing (DE)
     02/26 - Wien (AT)

Classroom-Seminar: Geometry modelling with ANSYS SpaceClaim Direct Modeler and basics of meshing

     02/21 - Berlin (DE)
     02/26 - Wien (AT)

Classroom-Seminar: Introduction to explicit structural mechanics with LS-DYNA

     02/20 - Chemnitz (DE)

Classroom-Seminar: Advanced explicit structural mechanics with LS-DYNA

     03/20 - Chemnitz (DE)

Classroom-Seminar: Simulation of composites with ANSYS Composites PrepPost and LS-DYNA

     04/25 - Grafing (DE)

Classroom-Seminar: Optimization and reverse engineering with optiSLang inside ANSYS Workbench

     01/22 - Grafing (DE)
     03/11 - Aadorf (CH)

Additional Courses are offered – please check the website for upcoming dates for: FTI Forming Suite - DIGIMAT DIFFPACK and others.

Individual Training: Take advantage of the expertise of our specialists and get to know how simulation processes in your company can be arranged in an optimal way.

The Complete Courses Offered Can Be Found At: www.dynamore.de/en

Intro LS-DYNA

02/04   03/18   Spotwelds Seminar

04/24   05/06   02/18   04/23

Intro to LS-PrePost   Contact Definitions Seminar

02/07   03/31   03/22

Infoday DYNAstart   Intro Safety Seminar

02/21   03/15   04/29

04/23   05/13

The Complete Courses Offered Can Be Found At: www.lstc.com

February 25-27, 2013	ALE/EULERIAN & Fluid/Structure Interaction in LS-DYNA	CA
February 28-March 1, 2013	Smoothed Particle Hydrodynamics (SPH) in LS-DYNA	CA
March 14-15, 2013	Blast & Penetration	MI
March 18, 2013	Introduction to LS-PrePost (no charge)	MI
March 19-22, 2013	Introduction to LS-DYNA	MI
March 19-20, 2013	Advanced Options in LS-DYNA	CA
March 21-22, 2013	Contact in LS-DYNA	CA

March 1st – Internet: LS-DYNA The Implicit Solver

April 12th MI Modeling Warm Forming and Hot Stamping

May 3rd Presented by Al Tabiei – Getting Started with LS-DYNA Blast & Penetration

The Complete Courses Offered Can Be Found At: www.dynamore.se

March 12th
   ANSA & mETA-Post, introductory

March 19
   LS-DYNA Implicit Analysis

April 16
   LS-DYNA simulation of sheet metal forming
processes

April 23

   LS-DYNA material modeling

May 14
   Contacts in LS-DYNA

May 21
LS-PrePost3, Introduction

May 22
   LS-DYNA Introductory

The complete Training Courses offered can be found at www.dynasplus.com

Please check the site for accuracy and changes.

DynAS+ regular training class in 2013

LS-DYNA Introduction Explicit Solver
        09-11/09

LS-DYNA Introduction Implicit Solver
        23/09

LS-DYNA Unified Introduction Implicit &
Explicit Solver
        14-17/01, 17-20/06 & 09-12/12

LS-OPT & LS-TaSC Introduction
        06-07/02 & 16-17/10

Switch to LS-DYNA
        8-9/04 & 12-13/11

Switch from Ls-PrePost 2.X to 3.X/4.X
        10/04 & 25/09 & 14/11

LS-DYNA Advanced Implicit Solver
        24/09

LS-DYNA ALE / FSI
        04-05/02 & 14-15/10

LS-DYNA SPH
        13-14/05 & 7-8/10

LS-PrePost 3.X/4.X – Advanced meshing
capabilities
        11/04 & 26/09 & 15/11

LS-DYNA User Options
        15-16/05

LS-DYNA – Plasticity, Damage & Failure –
By Paul DU BOIS
        26-27/11

LS-DYNA – Polymeric materials – By Paul
DU BOIS
        28-29/11

LS-DYNA – Geo-material modeling
        27-28/05

LS-DYNA – Geo-material calibration
        29/05

LS-DYNA Introduction -Forming
        18-21/03

http://www.dfe-tech.com/training.html

DFETECH offers various training courses in the field of sheet metal stamping and vehicle engineering.

Some of the courses are listed below:

- Introduction to LS-DYNA
- Fundamental of eta/DYNAFORM
- Fundamental of eta/VPG
- Basic of Impact Analysis
- Vehicle Crashworthiness Analysis

- Modern Formability Integrated Draw Die Development and Simulation

- Tailor-Welded Blank Application
- Advanced Circle Grid and Thinning Strain Analysis
- Fundamental of Die Design
- Fundamental of Hydroforming
- Formability Engineering Analysis

Engineering Technology Associates

The Complete Courses Offered Can Be Found At: www.eta.com   etainfo@eta.com

Please check the site for dates

Among the many course offering are the following:

Introduction to DYNAFORM

Introduction to PreSys

Introduction to LS-DYNA

The Complete Courses Offered Can Be Found At: www.caeai.com

Please check the site for 2013 courses

Among the many course offering are the following:

ANSYS Training, CFD and FEA Consultants Serving CT, NJ, NY, MA, NH , VT

For course location visit www.alyotech.fr

Please check the website for current listing of courses.

May 2013   By: Dr. Nielen Stander, LSTC

10th World Congress on Structural and Multidisciplinary Optimization
   May 19-24, 2013, Orlando, Florida, USA

Session Announcement:
"Optimization in Nonlinear Dynamics"
   Organized by:
      Dr. Nielen Stander
      LSTC
held at 10th World Congress on Structural
and Multidisciplinary Optimization

"I am organizing a session on "Optimization in Nonlinear Dynamics" at the next conference of the International Society for Structural and Multidisciplinary Optimization (WCSMO10). As a user of LS-DYNA, I would like to invite you to submit an abstract to this session. Inorder for me to provide early feedback, interested participants may submit their abstracts to nielen@lstc.com a week or two prior to the deadline." Nielen Stander

Contributions for this session may include:

- Crashworthiness Optimization
- Optimization in Fluid Dynamics
- Optimization in Reactive Flow
- Optimization in Electromagnetics
- Optimization in Fluid-Structure Interaction
- Optimization using LS-DYNA
- Parameter Identification of Nonlinear Materials
- Topology Optimization in Nonlinear Dynamics

The 500 words abstract submission deadline is January 15, 2013

Final abstracts must be submitted, directly through the conference website, by January 15, 2013.

General information about the conference can be found on the conference web site
  http://conferences.dce.ufl.edu/wcsmo-10 .

Nielen Stander
(nielen@lstc.com)

nhance is organizing 6th annual Update Meetings of LS-DYNA and Oasys software in India:

Pune –   Tuesday, 23rd April 2013 – The Ista Hotel, 88 Nagar Road, Pune.

Bangalore – Thursday, 25th April 2013 – The Taj Vivanta, Whitefield, Bangalore.

nhance Engineering Solutions Pvt Ltd and Oasys Ltd are pleased to announce the 6th Oasys LS-DYNA Update meetings in India for the year 2013. First meeting shall be held at Pune on Tuesday 23rd   April 2013 at The Ista Hotel and second meeting shall be held at Bangalore on Thursday 25th April 2013 at The Taj Vivanta, Whitefield.

Each of these is a full day free of charge event covering both LS-DYNA and Oasys software and is a perfect opportunity to find out about current and future developments and how the software is being used in the engineering community.

The presentations will mainly cover latest features of LS-DYNA software, Oasys suite from LSTC, Oasys respectively. We are pleased to have guest Lectures from Tata Motors, Maruti Suzuki and other OEMs. Detailed agenda shall be published next month

Registration: Please send your registration to this event by email to india.support@arup.com with your name, company/affiliation, telephone number and your choice for event.

Venue: The event in Pune will be held at The Ista Hotel, which Situated in the heart of the city, 10 minutes drive from the airport and adjacent to the tranquil Aga Khan Palace.

The Ista Hotel
88/4, Pune-Nagar Road (Adj. Aga Khan Palace) Yerwada Pune - 411 006,India
Tel: 91(20) 41418888

The event in Bangalore will be held at The Taj Vivanta, Whitefield which stands right at the main entrance to the International Tech Park, Bangalore.

The Taj vivanta - ITPB, Whitefield
Bangalore 560 066,India
Tel No.:91-80-6693-3333

If you plan to stay over before or after the event, we are pleased to confirm that we have negotiated a special rate for attendees of the Oasys LS-DYNA Update meeting. Please contact us for assistance.

Contact Details: If you have any queries regarding this event you can contact:

Mr. Asif Ali -
nhance Engineering Solutions(P)Ltd
Plot No. 39, Ananth Info Park, HiTec City-Phase 2
Madhapur, Hyderabad-500081,India
Tel: +91 (0) 40 44369797/8
 Email: india.support@arup.com

June 19 - 21, 2013   www.usersmeeting.com/en.

Invitation & Call For Papers
ANSYS Conference & 31st CADFEM Users' Meeting 2013
June 19th – 21st, 2013, Rosengarten Mannheim, Germany

The Users´convergence

"Convergence" is this year's motto for all the ANSYS Users´ conferences taking place around the world. Traditionally, the conference with the largest content of information is the ANSYS Conference & CADFEM Users´ Meeting held in German. Therefore, a very large number of ANSYS users meet, or "converge", at this event to exchange ideas, experience and news, and actively increase their know- ledge. The interdisciplinary specialist conference organized by CADFEM and ANSYS Germany is an excellent opportunity for those who are interested in but do not yet belong to the users´ community, to become more acquainted with the practical use of numerical simulation.

Convergence of contents and requests
Software updates, user reports and compact seminars – it's the mix that makes it work. We are most happy to satisfy the requests of former participants and will reduce the number of product presentations, thus providing more opportunities for technical information and training. Get first-hand tips and tricks on achieving precise simulation results even faster or on how to cope with new challenges using ANSYS, other tools and a first-class IT environment.

Call for Papers

Early bird discounts available until 22nd February 2013
Whether you apply as a lecturer or participant, by registering early, i.e. by and no later than February 22nd 2013, you will receive a 10% early bird discount on your registration fee, because early registrations are a great help for the event organizing team. Cancellations made up to one month before the conference starts will not be charged.

We cordially invite you and look forward to meeting you in Mannheim in June!

The CADFEM & ANSYS Germany Team
.

9th European LS-DYNA Users' Conference

Location: Manchester Central Convention Complex, Manchester, UK

Welcome Reception and Social Event:
  Sunday 2nd June 2013

Conference:
  Monday 3rd and Tuesday 4th June 2013

Gala Dinner:
  Monday 3rd June 2013

Arup are pleased to announce that the 9th European LS-DYNA Users' Conference will be held at Manchester Central Convention Complex, UK on 3rd and 4th June 2013.

Manchester is situated in the centre of the UK with one of the world's best connected international airports and efficient road and rail links. The event will give those in academia and industry a chance to present their work to colleagues and additionally to catch up on the latest developments in the software. Attendees can also meet with exhibitors to find out more about hardware, software and services relating to LS-DYNA.

On the evening of Monday 3rd June the Gala Dinner will take place at the Museum of Science and Industry, just a short walk from the conference venue. The museum brings to life innovation and invention from science and industry through the ages even offering rides on 'Planet', a reproduction steam locomotive!

Important dates:

Registration Opens: end of September 2012
Abstract Deadline: end of December 2012
Papers Deadline: end of April 2013

If you would like to attend, present, exhibit or sponsor, please visit our conference website at: http://arup.cvent.com/euroconference.

We look forward to welcoming you to the event!

**The 5th ANSA & µETA
International Conference**

June 5th to June 7th 2013,

The MET Hotel, Thessaloniki, Greece.

**There is no participation fee for this event.
Speakers will receive free accommodation.
The language of the event is English.**

For Complete Information: http://www.beta-cae.gr/conference05_announcement.htm

The principal aims of this event are to bring the CAE Community together and to promote an international exchange of the latest concepts, knowledge and development requirements on our software products.

Technical papers will be presented outlining the latest advances in CAE strategy, methodology, techniques and applications related to our products. Participants will have the opportunity to be informed about the latest software trends, demonstrate their concepts and achievements and present new development requirements. The closer technical communication with the software developers' team of our products, within the framework of a technical forum, features this three-day conference.

Further discussions, sessions, meetings and events will allow the interaction between participants and organizers. Senior executives of our company, the engineers from the development and services teams and our business agents from around the world will be glad to meet with customers and users, to discuss the applications, the existing functionality, latest enhancements and future development plans of our software products. We expect that this will be a unique opportunity for you to share your success and for us to share our vision.

Dates:
Abstracts submission: February 28th, 2013
Acceptance notification: March 22nd, 2013
Speakers' registration: April 17th, 2013
Final manuscripts submission: April 26th, 2013
Delegates Registration: April 26th, 2013
Presentations files submission: May 10th, 2013
Welcome reception: June 4th, 2013
Event: June 5th to June 7th 2013

Oct. 16ᵗʰ-18ᵗʰ, 2013

Dalian, China

In recent years, China witnessed a rapid growth in the CAE technology. As leading finite element software in the industry, LS-DYNA has been well acknowledged and widely adopted in various industries such as Automotive, Aerospace and Aeronautics, Die Casting and Electrical & Electronics.

LSTC is a well-known software engineering company providing complete engineering software package including LS-DYNA, LS-PREPOST and LS_OPT. For better serving our customers in China, LSTC is hosting the first China LS-DYNA Users' Conference on Oct. 16 at Dalian, China. It is our chance to introduce new features in LS-DYNA and your chance to

to share your LS-DYNA experience. The conference provides an opportunity to interact with industry experts, end users and LSTC developers. LSTC expects the conference to be held regularly and become a platform for researchers and engineers exchanging ideas and advocating new developments.

We aim to encourage the communications between software developers and users and among users themselves. Users in academia and industry would have a chance to share their research and experience. People from LSTC would have a chance to share their new developments. We welcome all LS-DYNA users to share their knowledge by submitting papers.

Conference Hosts:
Livermore Software Technology Corp.
Dalian Fukun Technology Co., LTD

Conference: Oct. 16th-18th, 2013

Training courses: Oct. 15th-16th, 2013

Location:
Yinfan Hotel, 135 JinMaLu Road, Dalian Development Zone, Dalian, China.

Conference website:
http://www.lsdyna.cn   http://www.dalianfukun.com/conference

Contact us: chinaconf@lstc.com

FACEBOOK

BETA CAE SYSTEMS SA
  http://www.facebook.com/pages/BETA-CAE-Systems-SA/193472524006194

Cray Inc.
  http://www.facebook.com/crayinc

ESI Group
  http://www.esi-group.com/corporate/facebook/

TWITTER

BETA CAE SYSTEMS SA
  http://twitter.com/betacae

Cray Inc.
  http://www.twitter.com/cray_inc

ESI Group
  http://twitter.com/ESIgroup

ETA
  http://twitter.com/ETA_Inc

GNS
  https://twitter.com/gnsmbh

LINKEDIN

BETA CAE SYSTEMS SA

http://www.linkedin.com/company/beta-cae-systems-s.a.?trk=fc_badg

Cray Inc.

http://www.linkedin.com/company/4936

ETA

http://www.linkedin.com/groupRegistration?gid=1960361

Oasys

http://www.linkedin.com/groups/Oasys-LSDYNA-Environment-Software-4429580?gid=4429580&trk=hb_side_g

YOUTUBE

BETA CAE SYSTEMS SA

http://www.youtube.com/user/betacae

Cray Inc.

http://www.youtube.com/user/crayvideo

ESI Group

http://www.youtube.com/ESIgroup

ETA

http://www.youtube.com/user/etainfo1

NEWS FEEDS

ETA: http://eta.com/company/news-eta?format=feed&type=rss

About

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.

THUMS is limited to civilian use and may under no circumstances be used in military applications.
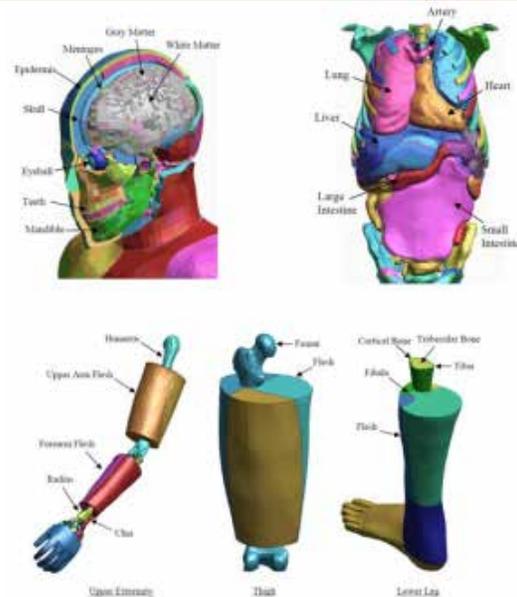
Model Details: Each of the different sized models is available as sitting model to represent vehicle occupants and as standing model to represent pedestrians.

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

LSTC is the US distributor for THUMS. Commercial and academic licenses are available.
For more information please contact us at THUMS@lstc.com .
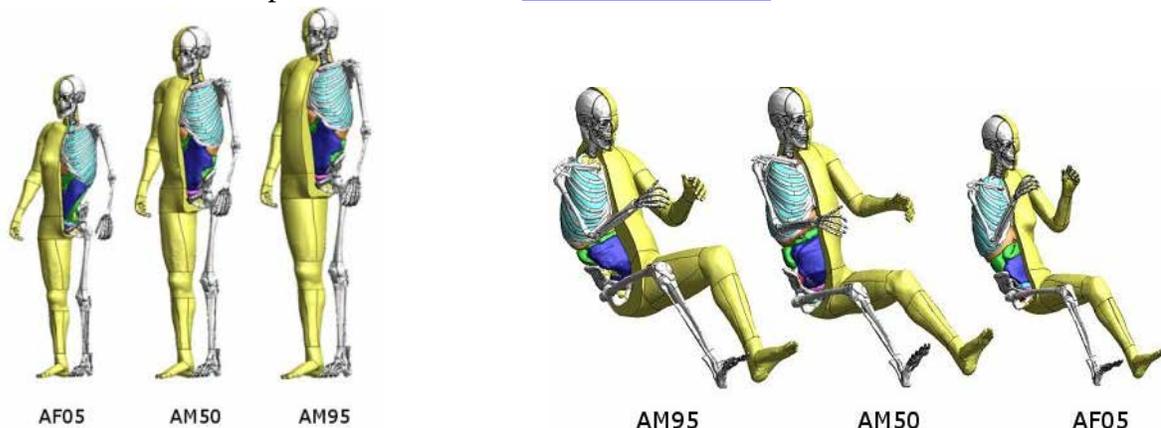
THUMS®, is a registered trademark of Toyota Central R&D Labs.

HPC on-demand for academic users

**Run your LS-DYNA simulations and pay for what you use
on a turn-key environment**

- · For LSTC academic customers.
- · Run your simulations from 0.05 €/CCH without reservation
- · Remote visualization using LS-PrePost
- · Avoid installation and maintenance costs
- · Other simulation applications also ready to use
- · Global connectivity, remote graphics and collaborative environment
- · Large number of cores available

For more information please visit: www.gompute.com

Price for computing-core/hour (CCH). Licenses and account set up are not included. Pricing valid only for universities, academic centers and research institutes. The following are trademarks or registered trademarks of Livermore Software Technology Corporation in the United States and/or other countries: LS-DYNA, LS-OPT, LS-PrePost, LS-TaSC. Gompute is owned and operated by Gridcore AB, 2012 All rights reserved.

GOMPUTE
A GRIDCORE COMPANY

The Gompute User Group Meeting is a conference oriented to the simulation industry which provides an opportunity to professional users and providers to share knowledge and meet personally. Here you can find more about simulation software, high performance computing hardware and other people experiences in the field of simulation.

Scope of the Meeting: The use of numerical simulations for the evaluation of prototypes and processes is a growing industry which allows time shortening of development. This takes place in many different areas as Continuum Mechanics, Computational Chemistry, Electromagnetics, Risk modeling, Rendering, etc. Commercial implementations of such a tool has gained in maturity and reliability and the Simulation Industry is a growing market which naturally prompts other associated areas such as High performance computing hardware and System integration.

The intention of the Organizing Committee for Gompute Users Meeting 2013 is to gather all relevant actors in the Simulation Industry in the Nordic countries:

Gompute User Meeting 2013
April 23rd -24th, 2013
8th Gompute User Meeting
Scandic Crown Hotel,
othenburg Sweden.

Meetings:
Tuesday the 23rd 8 am until 5 p.m.
Wednesday 24th, 9 am until 4 pm.

Evening event takes place at:
Villan Chalmers
Tuesday 23rd of April at 7 pm

1. Engineers (Fluid Dynamics, Stress analysis, Electromagnetism)
2. Scientific users
3. Decision makers for HPC investments
4. Contractors
5. Academics
6. Users in general

Topics to be covered by the convention are:

1. Simulation Tools (both commercial and free), this includes: Fluid Dynamics, Stress Mechanics, Visualization, Mesh generation, Model Optimization, etc...
2. Simulation Techniques
3. Computing Hardware
4. Linux for High Performance Computing.

Registration: This event is free of charge. To register for the event please visit: www.gompute.com

We hope to meet you at Gompute User Meeting!

LS-DYNA®
SMP PRICING

LS-DYNA® SMP Version for Windows Workstations

(does NOT include server versions)

SMP version license only, (**LS-DYNA MPP is not included**)

- Workstation versions of Microsoft Windows®
  - Version XP and above.
- Executable is node locked to a single user workstation.
- Simultaneous jobs permitted, up to a total in-use core count of 16.
  - 16 one-core, 8 two-core, 4 four-core, etc.,
- In general the scaling of SMP version is comparable to MPP versions up to 4 cores. Scalability is problem dependent and is not guaranteed.

Includes:

- Pre- and Post-processor LS-PrePost®
- Optimization Software: LS-OPT® and LS-TaSC™
- LSTC dummy and barrier models
- All Features of LS-DYNA® are included: Explicit, Implicit, CFD, Thermal,…

For Information contact LSTC.

Livermore Software Technology Corp. ,
7374 Las Positas Road, Livermore, CA 94551
Telephone: (925) 449-2500 ● Fax: (925) 961-0806
www.lstc.com   sales@lstc.com

|	
Time-Domain Finite Element Methods for Maxwell's Equations in Metamaterials (Springer Series in Computational Mathematics	*Jichun Li*
Finite Element Analysis: A Primer (Engineering)	*Anand V. Kulkarni - V.K. Havanur*
Finite Element Methods for Engineers	Roger T. Fenner
July 2013 Finite Element Mesh Generation	*Daniel Lo*
January 2013 The Finite Element Method: Theory, Implementation, and Applications (Texts in Computational Science and Engineering)	*Mats G. Larson -, Fredrik Bengzon*
January 2013 Finite and Boundary Element Tearing and Interconnecting Solvers for Multiscale Problems (Lecture Notes in Computational Science and Engineering)	*Clemens Pechstein*
January 2013 Structural Analysis with the Finite Element Method. Linear Statics: Volume 2: Beams, Plates and Shells (Lecture Notes on Numerical Methods in Engineering and Sciences)	*Eugenio Oñate*
Elementary Continuum Mechanics for Everyone: With Applications to Structural Mechanics (Solid Mechanics and Its Applications)	*Esben Byskov*
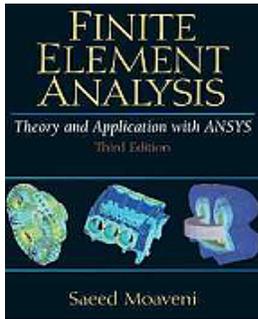
[Finite Element Analysis Theory and Application with ANSYS (3rd Edition)](#)
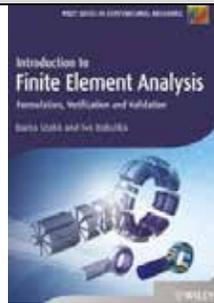
Saeed Moaveni
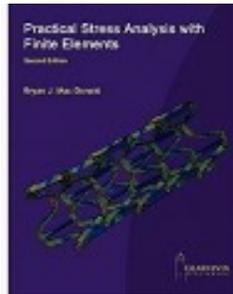
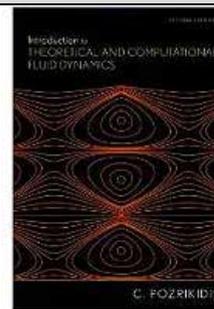[Practical Stress Analysis with Finite Element](#)

Bryan J Mac Donald
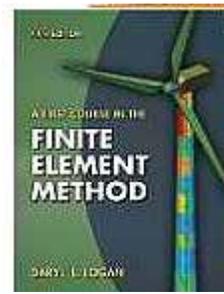
[A First Course in the Finite Element Method](#)

Daryl L. Logan

[Finite Element Modelling Techniques in MSC.NASTRAN and LS/DYNA](#)

Sreejit Raghu

[Finite Element Analysis/formulation & verification](#)
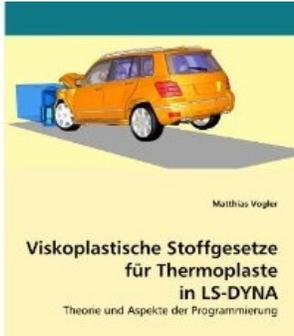
B. A. Szabo

[Introduction to Theoretical and Computational Fluid Dynamics](#)
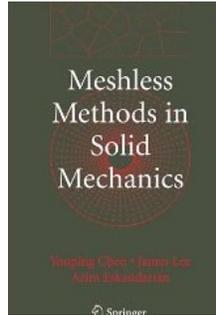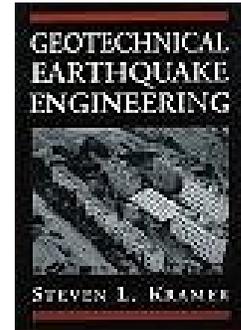
C. Pozrikidis

[Viskoplastische Stoffgesetze für Thermoplaste in LS-DYNA: Theorie und Aspekte der Programmierung](#)
Matthias Vogler

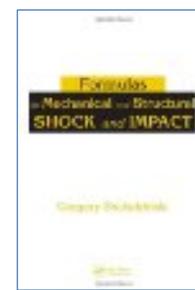[Meshless Methods in Solid Mechanics](#)

Youping Chen

[Geotechnical Earthquake Engineering](#)

Steven Lawrence Kramer

[Biomechanical Systems Technology: Computational Methods](#)
Cornelius T. Leondes

[Numerical response of steel reinforced concrete slab subjected to blast and pressure loadings in LS-DYNA.](#)
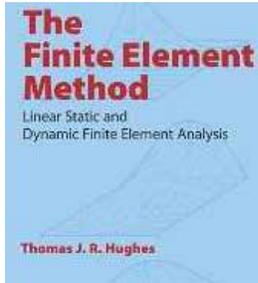**Vivek Reddy**

[Formulas for Mechanical and Structural Shock and Impact](#)
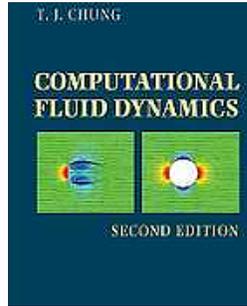**Gregory Szuladziniski**

[The Finite Element Method](#)
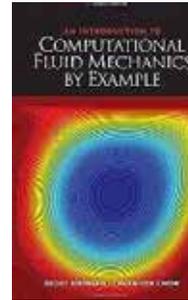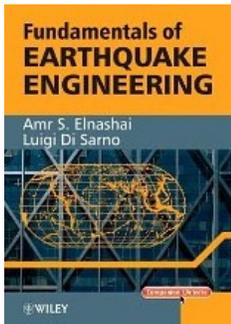
Thomas J. R. Hughes

[Computational Fluid Dynamics](#)

T. J. Chung

[An Introduction to Computational Fluid Mechanics by Example](#)

Sedat Biringen

[Fundamentals of Earthquake Engineering](#)

Amr S. Elnashai
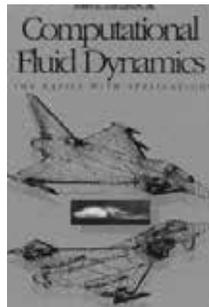
[Computational Fluid Dynamics](#)

John David Anderson
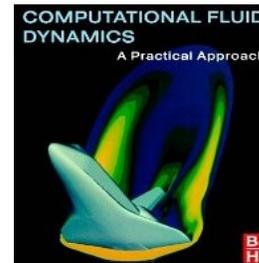
[Computational Fluid Dynamics: A Practical Approach [Paperback]](#)

Guan Heng Yeoh

Theories, Methods… **Ping Hu, Ning Ma, …**	**CFD for Engineers**	**CAE design and sheet metal forming…** **Li Fei Zhou Deng**	**Applied Metal Forming**
Micro Metal Forming (Lecture Notes in Production Engineering)			
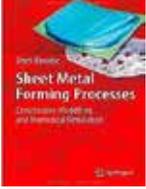
Explosives Modeling For Engineers
A New LS-DYNA Course by Paul Du Bois & Len Schwer

Photo credit:

"Instability of Combustion Products Interface from Detonation of Heterogeneous Explosives" David L. Frost, Zouya Zarei, and Fan Zhang – with permission to use.

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

Modeling explosives is analogous to material modeling: LS-DYNA offers numerous models for both and the user needs to select an appropriate model based on both applicability to the application of interest and the availability of appropriate input parameter data. While the selection of an appropriate material model is often driven by the availability of the input parameter data, analysts over time develop a more in depth theoretical knowledge of some material models, a personal library of material parameters and thus a preference for certain

material models. However, when it comes to explosive modeling, most engineers rely entirely on literature references to equations-of-state with provided data. Typically, little effort is spent on acquiring any theoretical knowledge of the equations-of-state being used, nor how the input parameters were determined.

Such cursory knowledge of explosives is often deemed acceptable, and may likely be acceptable in simulations involving fairly large standoff distances between explosive and target. However, for simulations where the explosive charge and target are not distant, or for sympathetic detonation of explosives, a more thorough knowledge of explosive modeling is required.

This class focuses on the application of LS-DYNA to modeling explosives. The modeling methods are illustrated through case studies with sufficient mathematical theory to provide the user with adequate knowledge to then confidently apply the appropriate modeling method.

Intended Audience

This training class is intended for the LS-DYNA analyst possessing a comfortable command of the LS-DYNA keywords and options associated with typical Lagrange and Multi-Material Arbitrary Lagrange Eulerian (MM-ALE) analyses. The training class will attempt to provide the analyst with the additional tools and knowledge required to model explosives for a range of applications. The typical attendee is likely to have a background in defense applications, to include protective structures and vehicle vulnerability, Homeland Defense topics, and terrorist threat mitigation techniques. The theory and illustrations portions of the class will benefit LS-DYNA users and non-LS-DYNA users alike.

Class Topics

- Introduction to Explosives (Paul)
- Detonation Waves and Explosives (Paul)
- Simulation of Propellants with Application to Interior Ballistics (Paul)
- Impact Detonation via Ignition and Growth of Reaction in High Explosives (Len)

- Flyer Plate Calibration of Detasheet EOS (Len)
- Introduction to Non-Ideal and After Burning of Explosives (Len)
- Equivalency of TNT (Len)

Paul Du Bois and Len Schwer have combined their more than 50 years of experience in non-linear numerical analysis, consulting and training to provide in-depth instruction on several advanced LS-DYNA topics. Their unique team training approach provides an increased depth and breadth of topical knowledge, plus differing viewpoints on methods and motivation.

Their training classes provide sufficient theory to allow analysts to understand the underlying phenomenon and solve more than just example problems. They disdain the "what to put" type training that emphasizes "typical" values for keyword parameters. Practical examples are presented by the instructors - thus no class time is wasted learning tedious keyword input, but rather learning concepts, and limitations, that are critical to effective use of LS-DYNA's advanced methodologies.

Schedule of future classes and pricing available at www.duboisschwertraining.com

2013 New Courses are available from Livermore Software Technology Corporation. LSTC Developers, and Consulting Instructors have developed a series of (1) one day specialty seminar/course training series.

Brochure available – contact class@lstc.com

Contents

Date	Location	Class	Instructor
March 01	**The Implicit Solver LS-DYNA**	**Internet**	**Al Tabiei**
April 12	**Using the heat transfer capabilities in LS-DYNA**	**MI**	**Arthur Shapiro**
April 16	**ICFD and FSI problems in LS-DYNA R7**	**MI**	**Inaki Caldichoury**
April 17	**ICFD and Conjugate Heat Tranfer problems in LS-DYNA R7**	**MI**	**Inaki Caldichoury**
April 18	**EM in LS-DYNA R7**	**MI**	**Inaki Caldichoury**
May 15	**ICFD and FSI problems in LS-DYNA R7**	**CA**	**Inaki Caldichoury**
May 16	**ICFD and Conjugate Heat Tranfer problems in LS-DYNA R7**	**CA**	**Inaki Caldichoury**
May 17	**EM in LS-DYNA R7**	**CA**	**Inaki Caldichoury**

LSTC Internet Class Series - LS-DYNA The Implicit Solver

March 01, 2013   Instructor: Al Tabiei
Contact class@lstc.com **to register**

Implicit Nonlinear
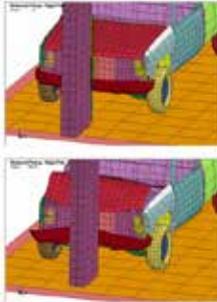
**Implicit One Day Internet Class
Registration: $375   Student: $150**
For LS-DYNA users to get started on implicit problems with minimal effort.

The most important elements to start using LS-DYNA Implicit successfully will be presented including an additional, no fee, workshop.

Implicit Eigenvalue

Additional workshop: There is an optional one day (8 hours) of workshop on line, at no additional cost, to be determ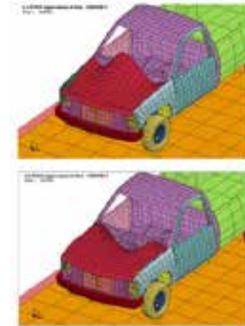ined the day of the class.   The workshop online is not necessary to get started with LS-DYNA Implicit.   However, it is recommended for LS-DYNA users in this field.
Class Material: Course notes will be available for download the morning of the class.
A 30-day demo LS-DYNA license will be authorized after the class to continue your learning experience.

Sections covered during the course

**March 01, 2013   8 hours
Eastern Standard Time**
Class: 8:30 - 10:00
Break: 10:30 - 12:00
lunch :   12:00 - 1:00
Class: 1:00 - 3:30
Break: 3:30 - 4:00
Summary 4:00 - 4:30

1.   Implicit versus Explicit
2.   Equilibrium, Nonlinearity, and Linearization
3.   Activating the Implicit Solver
4.   Material Models and Element Types
5.   Contact for Implicit
6.   Eigenvalue Analysis
7.   Dynamic Analysis using Modal Results
8.   Springback
9.   Additional Implicit Features
      * Explicit-Implicit Switch
      * Buckling Analysis
      * Control Implicit Termination
      * Inertia Relief
      * Consistent Mass
      * Condensation

**Certificate of Completion
issued: Livermore Software
            Technology Corporation**

10. Implicit in MPP   11.   Linear Equation Solver
12. Practical Guidelines
13. Trouble Shooting and Ways to Battle Divergence
14. Summary

April 12th, 2013 Using the heat transfer capabilities in LS-DYNA.
LSTC Michigan Office   **Instructor:**   **Dr. Arthur Shapiro**
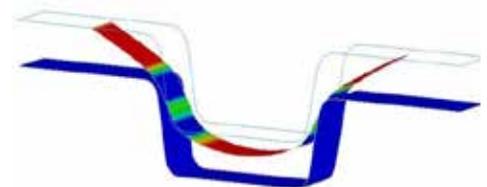**LSTC 1 Day Series**   **Registration: $100.00   Students $ 50.00**
                    Contact: class@lstc.com

Hot Stamping
Process

fringes of
temperature

Description: This class provides guidelines in using the heat transfer capabilities in LS-DYNA to model coupled thermal-stress problems with a focus on warm forming and hot stamping manufacturing operations. It is intended for people with a background in using LS-DYNA for computational mechanics, but who are not familiar with modeling heat transfer or coupled thermal-stress.

Class Material: A 30-day demo LS-DYNA license will be authorized after the class to continue your learning experience. Course Notes will be distributed the morning of the class.

Sections covered during the course

· Getting Started – Learn to create a KEYWORD input file to solve for the thermal *expansion of an aluminum block. Lean how to interpret LS-PrePost temperature fringe* plots to gain knowledge of the physical process.

· Equation Solvers & Nonlinear Solution Method - Learn the advantages and disadvantages of the Gauss direct solvers & conjugate gradient iterative solvers in LS-DYNA. Learn the nonlinear heat transfer keyword parameters and how Newton's nonlinear method works.

· Time Step Control – Learn how to select a thermal and mechanical time step size, and understand the difference between explicit and implicit solution methods.

· Initial and Boundary Conditions – Learn how to define temperature, flux, convection, and radiation boundary conditions. Learn how to hand calculate a convection heat transfer coefficient, which is the parameter with the greatest uncertainty in your model.

· Thermal-Mechanical Contact – Learn thermal-mechanical contact modeling issues with sheet metal forming applications.

· Thermal-stress coupling – An introduction to coupled thermal stress modeling. Topics include conversion of plastic work to heat, conversion of sliding friction to heat, and calculation of thermal expansion. Thermal-mechanical material constitutive models are also presented.

· Modeling Hot Stamping - The Numisheet 2008 B-pillar hot stamping benchmark problem BM03 is presented and solved.

· Modeling Warm Forming - The Numisheet 2011 magnesium warm forming benchmark problem BM02 is presented and solved

Class Information: Class Starts at 9AM. Lunch will be provided.
Certificate of Completion issued: Livermore Software Technology Corporation

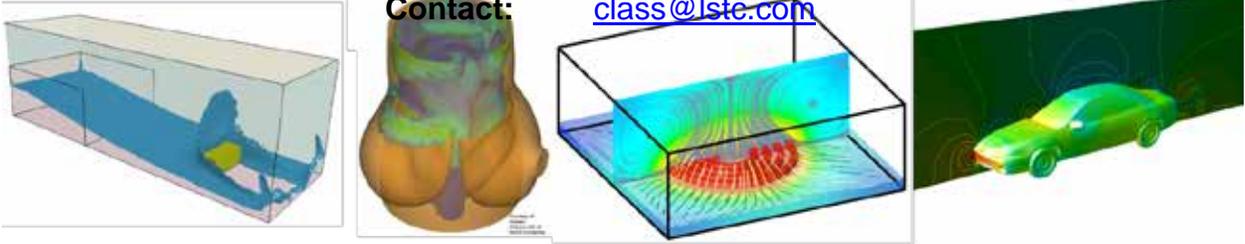**April 26th, 2013 Incompressible CFD (ICFD) and FSI in LS-DYNA R7**

LSTC Michigan Office   Instructor: Iñaki Çaldichoury
LSTC 1 Day Series   Registration: $100.00 Students $50.00
Contact: class@lstc.com

Description: This class provides an introduction to the Incompressible CFD (ICFD) solver in LS-DYNA. Key physical and numerical concepts are presented; keyword examples are described and studied. A special focus

Prerequisite: A background in using LS-DYNA for computational mechanics. CFD basic knowledge is appreciated but not mandatory. It is not necessary to have any experience using the classic so called ALE module for modeling fluids in LS-DYNA.

Class Material: A 30-day demo LS-DYNA license will be authorized after the class to continue your learning experience. Course Notes will be distributed the morning of the class.

Sections

Introduction to the ICFD solver
- o Background
- o Main characteristics
- o Examples of applications

Setting up a pure ICFD problem
- o Step by step keyword set up
- o Mesh refinement tools
- o Advanced features

Current and future post treatments

General principles
- o Fluid mechanics
- o The Volume mesher
- o FSI and thermal coupling

FSI problems
- o Loose FSI coupling
- o Strong FSI coupling
- o Advanced mesh control tools

Documentation and references

Class Information: Class Starts at 9AM. Lunch will be provided.
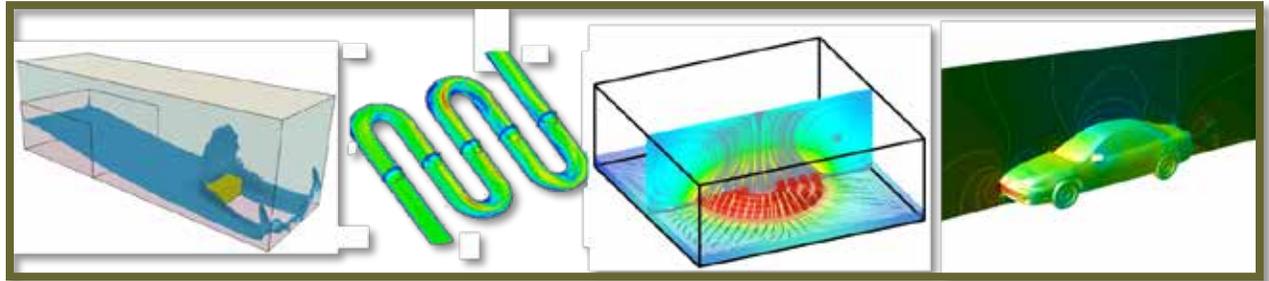
FEA Information Engineering Solutions

#2 Conjugate: Incompressible CFD (ICFD) and Conjugate heat transfer in LS-DYNA R7
Instructor: Iñaki Çaldichoury
LSTC Michigan April 17th, LSTC California May 16th, 2013
LSTC 1 Day Series   Registration: $100.00 Students $50.00
Contact: class@lstc.com

Description: This class provides an introduction to the Incompressible CFD (ICFD) solver in LS-DYNA. Key physical and numerical concepts are presented; keyword examples are described and studied. Among the various possible applications, this class focuses on the coupling with the LS-DYNA thermal solver for conjugate heat problems.

Prerequisite: A background in using LS-DYNA for computational mechanics and thermal problems for solids. CFD basic knowledge is appreciated but not mandatory. It is not necessary to have any experience using the classic so called ALE module for modeling fluids in LS-DYNA.

Class Material: A 30-day demo LS-DYNA license will be authorized after the class to continue your learning experience. Course Notes will be distributed the morning of the class.

Sections

Introduction to the ICFD solver
  - o Background
  - o Main characteristics
  - o Examples of applications

Setting up a pure ICFD problem
  - o Step by step keyword set up
  - o Mesh refinement tools
  - o Advanced features

Current and future post treatments

General principles
  - o Fluid mechanics
  - o The Volume mesher
  - o FSI and thermal coupling

Conjugate heat transfer problems
  - o Fluid only thermal problem
  - o Convection modeling
  - o Coupled conjugate heat transfer problems

Documentation and references

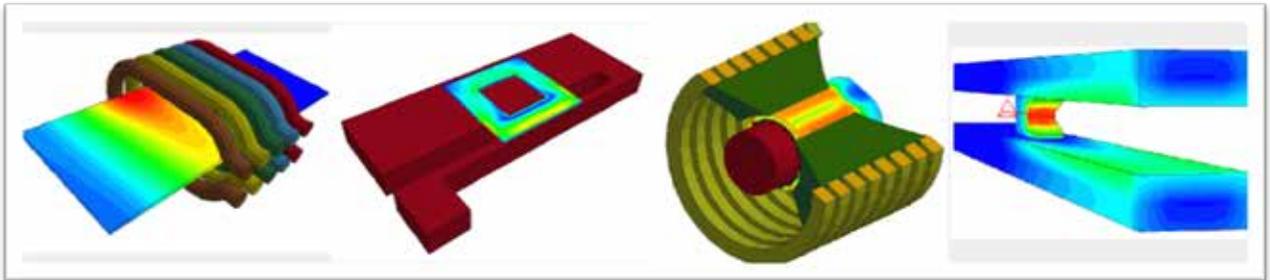**Class Information**: Class Starts at 9AM. Lunch will be provided.

#3   Electromagnetism (EM) in LS-DYNA R7
Instructor: Iñaki Çaldichoury
LSTC Michigan April 18th, LSTC California May 19th, 2013
LSTC 1 Day Series   Registration: $100.00 Students $50.00
                    Contact: class@lstc.com

Description: This class provides an introduction to the Electromagnetism (EM) solver in LS-DYNA. Key physical and numerical concepts are presented; keyword examples are described and studied. The main applications include magnetic metal forming, welding, bending, ring expansions, inductive heating, resistive heating, rail guns and so forth.

Prerequisite: A background in using LS-DYNA for computational mechanics and thermal problems for solids. Electromagnetism basic knowledge is appreciated but not mandatory.

Class Material: A 30-day demo LS-DYNA license will be authorized after the class to continue your learning experience. Course Notes will be distributed the morning of the class.

Sections

Introduction to the EM solver
- o Background
- o Main characteristics
- o Examples of applications

General principles
- o Electromagnetics
- o FEM-BEM system
- o Source terms
- o The FEMSTER library

Setting up an Eddy Current problem
- o Step by step keyword set up
- o Coupling with structural and thermal solvers
- o EM equation of states

Advanced capabilities
- o Inductive heating
- o Resistive heating
- o EM contact
- o Magnetic materials

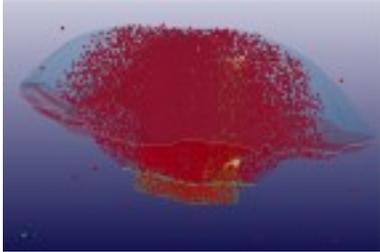**Current and future post treatments**

Documentation and references

Class Information: Class Starts at 9AM. Lunch will be provided.

Using the airbag particle method in LS-DYNA.

Instructors: **Dr. Jason Wang Dr. Hailong Teng**

LSTC 1 Day Series   Registration: $100.00   Students $ 50.00
Contact: class@lstc.com

The corpuscular particle method (CPM)

Developed for airbag deployment simulation
in LS-DYNA.

Description:

The corpuscular particle method (CPM) is developed for air•bag deployment simulation in LS-DYNA. In this method, the gas is modeled as a set of individual particles. The method could model the out-of-position (OOP) occupant interaction; it is simple, numerically robust, easier and faster than ALE. This course describes the corpuscular particle method (CPM) in LS-DYNA. It is compiled as a one-day training class, covering both background theory and practical usage of the method. The course is accompanied by a set of simple test models that help bring insight into possibilities and limitations of the method.

Class Material:

A 30-day demo LS-DYNA license will be authorized, after the class, to continue your learning experience. Course Notes will be distributed the morning of the class.

Sections covered during the course
- Introduction
- Kinetic molecular theory
- LS-DYNA CPM approach
- LS-DYNA keyword
- Case studies

Class Information: Class Starts at 9AM. Lunch will be provided.   class@lstc.com

WWW.LSDYNA-ONLINE.COM

LSDYNA-ONLINE is owned and operated by Al Tabiei

Getting Started with LS-DYNA (March 29, 2013)

This course will allow first time LS-DYNA users to get started with minimal effort. The most important elements to start using LS-DYNA will be presented in the 8 hours. There is an optional one day of workshop at an additional cost. The workshop online course is not necessary to get started with LS-DYNA. However, it is recommended for users.

- · Chapter-0 Introduction – LS-DYNA Manager
- · Chapter-1 Introduction to LS-PrePost
- · Chapter-2 Minimum Requirement to Run LS-DYNA
- · Chapter-3 Choosing Elements
- · Chapter-4 Choosing a Material Model
- · Chapter-5 Applying Loads
- · Chapter-6 Initial Conditions
- · Chapter-7 Boundary Conditions
- · Chapter-8 Defining Contact
- · Chapter-9 Output Control and Databases
- · Chapter-10 Critical Time Step
- · Chapter-11 Hourglassing
- · Chapter-12 Connecting Parts
- · Chapter-13 Damping
- · Chapter-14 How To Tell If Your FE Model Is Correct
- · Chapter-15 Summary
- · Chapter-16 Other Courses & References

For further information contact: courses@lsdyna-online.com or 513-3319139

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Getting Started With Blast and Penetration Using LS-DYNA (May 3, 2013)

This course will allow LS-DYNA users to get started on blast and penetration problems. The most important elements to start using LS-DYNA for such problems will be presented in the 8 hours. There is an optional one day (8 hours) of workshop at an additional cost. The workshop online course is not necessary to get started with LS-DYNA blast and penetration. However, it is recommended for users.

- 1-Introduction to Blast and Penetration
    - Introduction to Wave Propagation
        - § Wave propagation in incompressible material
        - § Wave propagation in compressible material
    - Numerical Techniques to solve High energy problems
        - § Lagrangian, Eulerian and ALE, SPH, and EFG
    - Which method should be used and sample applications
- 2-Blast & Penetration
    - Blast Wave Simulations Techniques
    - Guidelines for Penetration Simulation
    - Sample Applications:
- 3-Failure and Damage Modeling
    - Fracture, Damage, and Element Erosion
- 4-Blast Mitigation Structures (review of the literature)
    - Blast Mitigation Concepts
    - Blast Mitigation Concepts Civil/Structures
    - Seat Design for Blast Mitigation

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Getting Started With Fluid Structures Interaction Using LS-DYNA (April 5, 2013)

This course will allow LS-DYNA users to get started on using LSDYNA for Fluid Structure Interaction (FSI) problems. The most important elements to start using LS-DYNA for such problems will be presented in the 8 hours. There is an optional one day (8 hours) of workshop at an additional cost. The workshop online course is not necessary to get started with FSI LS-DYNA. However, it is recommended for users.

- Introduction
  - o When to use Eulerian and ALE
  - o Sample applications
- Eulerian capabilities
  - o Euler and ALE element library
  - o Boundary conditions
  - o Initial conditions
- Basic concepts of arbitrary Langrange-Euler (ALE)
  - o Advantages of ALE formulation
  - o How it works
- Basic concepts of Multi-Material
  - o When to use multi-material
  - o Advantages of multi-material formulation
- Basic concepts of fluid/structure coupling
  - o Different coupling methodologies
  - o When to use them
- Modeling techniques
  - o Mesh design
  - o Problem initialization
  - o Post-processing

For further information contact: courses@lsdyna-online.com or 513-3319139

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A sample of the first few pages of a published paper follows on the next pages

Validation Process of the Electromagnetism (EM) solver in LS-DYNA® v980: The TEAM Problems

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Abstract

LS-DYNA version 980 includes an electromagnetic (EM) solver that can be coupled to the solid mechanics and thermal solvers of LS-DYNA to take full advantage of its capabilities to successfully solve complex industrial applications such as magnetic metal forming or welding, induced heating, and so forth. This paper will provide some insight on the validation process that is currently under way and focus on the so-called TEAM (Testing Electromagnetic Analysis Methods) problems.

TEAM Workshops are meetings of an open international working group aiming to compare electromagnetic analysis computer codes. A series of TEAM Workshops was started in 1986 and has been organized in two-year rounds, each comprising a series of "Regional" workshops and a "Final" Workshop, as a satellite event of the COMPAQ Conference.

The TEAM problems consist in a set of test-problems, with precisely defined dimensions, constitutive laws of materials, excitations, etc., each backed by a real laboratory device, on which measurements can be made. The range of the TEAM problems cover a wide area of applications and features such as moving or non-moving conductor parts, magnetic elements, conductors in time dependent magnetic fields and so forth.

Several TEAM test cases and their simulation results that are part of the global validation process of the solver will therefore be presented highlighting some features and application domains of the solver.

1- Introduction

LS-DYNA version 980 aims to solve complex multi-physics problems involving electromagnetism, fluids or chemistry interacting with the solid mechanics and thermal solvers of LS-DYNA. As the development of these solvers progresses, several verification, validation and benchmarking tests have been conducted both internally at LSTC and externally by beta testing users in order to track bugs and improve numerical accuracy. This paper will focus on the electromagnetism solver (EM) and present some of the test cases studied internally that have been used in order to validate some newly implemented features. These test cases are all part of the so-called TEAM problems

TEAM Workshops are meetings of an open international working group aiming to compare electromagnetic analysis computer codes. A series of TEAM Workshops was started in 1986 and has been organized in two-year rounds, each comprising a series of "Regional" workshops and a "Final" Workshop, as a satellite event of the COMPAQ Conference [1].

The TEAM problems consist in a list of test-problems, with precisely defined dimensions, constitutive laws of materials, excitations, etc., and each backed by a real laboratory device, on which measurements can be made. Some of these TEAM problems have been reproduced and studied in order to validate some of the new features of the electromagnetism solver.

After briefly presenting the solver's main applications, this paper will focus on the new features that have been implemented and use some TEAM problems results for illustration. A brief description of each model will be given as well as some of the main results obtained. In the future, a more complete description of these test cases will be made available for users who would wish to try and reproduce them.

2- Summary of the solver's main applications

The Electromagnetism solver solves the Maxwell equations in the Eddy current (induction-diffusion) approximation. This is suitable for cases where the propagation of electromagnetic waves in air (or vacuum) can be considered as instantaneous. Therefore, this wave propagation is not solved. The Maxwell equations are solved

using a Finite Element Method (FEM) for the solid conductors coupled with a Boundary Element Method (BEM) for the surrounding air (or insulators). Thus, no air mesh is necessary (See [2], [3], [4] for more details).

The solver is also coupled with the solid mechanics solver in LS-DYNA and has been successfully used in order to solve complex problems involving magnetic forces and structural deformations such as in metal forming, metal cutting, metal welding or bending or high magnetic pressure generation.

Furthermore, the Joule heating is also taken into account for coupling with the LS-DYNA thermal solver thus allowing solving induced heating problems such as for instance, a coil moving over a conductive plate and heating it.

3- External magnetic field

### 3-1 Description

It is now possible to set up a uniform external magnetic field. The time dependency of each component in space can be set up through a load curve. This external magnetic field is then applied on the conductor parts where induced currents are generated and the classic Eddy current problem is solved [2], [3]. This feature can be useful in cases, where the user knows or has a good idea of the magnetic field generated by the coil on the workpiece. This way, he doesn't have to build to whole coil which can save a lot of calculation time.

3-2 The TEAM 4 problem

The TEAM 4 problem [1] is a simple test case which consists of a rectangular aluminum brick of conductivity with a rectangular hole placed in a time varying, space uniform magnetic field (See Figure 1 for the brick and hole dimensions). The magnetic field is perpendicular to the faces with the hole, and decays exponentially with time.

The main objective of the problem is to calculate the total circulating current density in the brick. Figure 2 shows the induced current vectors flowing around the hole and the magnetic field vectors oriented in the z-direction which get stronger closer to the hole. Figure 3 offers a superposition between the historical results [1] [5] obtained for the FELIX brick experiment and the LS-DYNA simulation. A good agreement can be observed despite the rather coarse mesh employed.
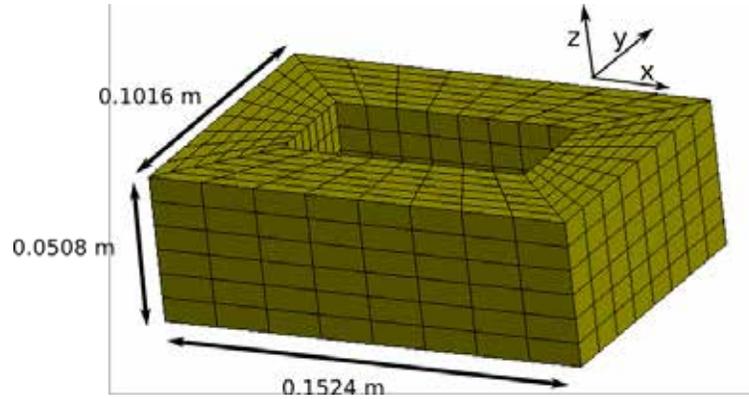
Figure 1 TEAM 4 Geometry and Mesh. Central hole: