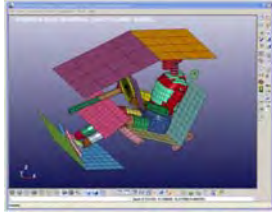


LS-PrePost



Update

Making A Difference



Mark Palmer M.D., Ph.D

Showcase



Sales - Support

Rubber-Band Powered Airplane



Analysis by LANCEMORE Corp.

The release of μ ETA v6.7.0



BETA CAE Systems S.A.

EC145



"Mercedes-Benz Style" helicopter

CaféNews

CaféNews

MCAD news on your desktop

MCAD news on your desktop

Challenge Your Knowledge



Question 3

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April Issue: LSTC – Release of LS-OPT® Version 4.2
May Issue: LS-TaSC Version 2

Announcements

LANCEMORE Corporation, located in Tokyo, Japan

We welcome LANCEMORE Corporation, a cutting-edge, non-linear FEA consulting company, extensively using LS-DYNA, and pioneering new fields of FEA. Additionally, they sell their material input data (Japanese domestic standards only).

CaféNews - MCAD news on your desktop

Mark your calendars, to make sure you don't miss, that within the next 2 weeks MCADCafe and its CafeNews will launch their DesignShowcase, featuring visual product development tours, from inception to manufacturing.

LSTC

Official Announcement For The 12th International Users Conference.

FEA Information Inc.

Showcasing LS-DYNA stand alone in China, the recognized Distribution Channel, and notice to users in China.

Sincerely, Marsha J. Victory, President, FEA Information Inc
mv@feainformation.com

From engineering to horses - <http://www.livermorehorses.com>



**Our Dusty with blue eyes.
Miniature Horse 24" tall
4 years old and not fond of learning, very fond of
running around and not listening to the words whoa,
stop, quit, stand.**



FEA Information

Participants

Platinum

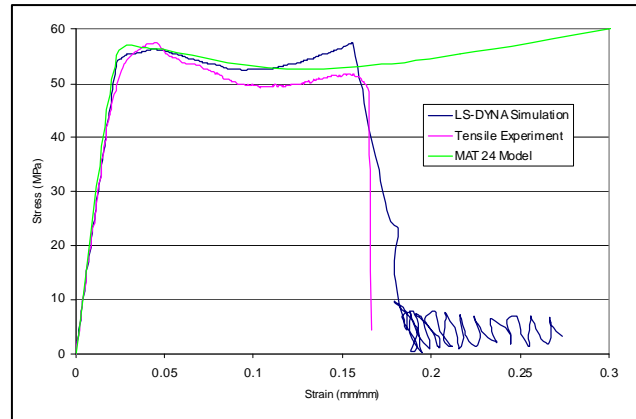
OASYS Ltd: http://www.oasys-software.com/dyna/en/	JSOL Corporation: http://www.jsol.co.jp/english/cae	SGI : http://www.sgi.com
ETA: http://www.eta.com	DYNAMore GmbH http://www.dynamore.de	ESI Group: http://www.esi-group.com
BETA CAE Systems S.A.: http://www.beta-cae.gr	LSTC: http://www.lstc.com	Dalian Fukun Technology Co. Ltd.:
MICROSOFT http://www.microsoft.com	Panasas, Inc. http://www.panasas.com	Shanghai Hengstar Technology Co. Ltd http://www.hengstar.com/
GridCore AB http://gridcore.se		

Bronze Participants

<u>Data Point Labs</u>	<u>APACS</u>	<u>Lancemore Corporation</u>
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Material Parameters for Crash/Safety CAE Simulation

DatapointLabs



Validation of high strain-rate tensile experiment against LS-DYNA. Source: [_](#)

It is often not a simple matter to obtain precise material parameters for CAE. Proper knowledge in many areas is necessary:

- Appropriate test samples must be used. Factors such as environmental conditioning must be considered
- Range of application temperatures: -40°C to 150°C
- All required properties must be measured and correct tests selected.
- Tests must be performed using properly designed procedures and strict quality control.
- Data must be fit to the ideal model using visual and quantitative measures, requiring extensive knowledge of non-linear modeling.
- Error-free input files must be provided for the CAE software.

In the case of non-linear simulations, an expert test facility that is familiar with

the requirements of the simulation and the proposed models can test the raw materials and convert material data into complex input files for various crash and CAE simulation software.

DatapointLabs understands the testing requirements and modeling for different simulation scenarios.

For most popular CAE/FEA codes, DatapointLabs offers *TestPaks®*, a specialized product line to allow users to order all the material testing needed for their CAE, and receive complete digital material models, ready for import into the specified code. The digital data include raw data, converted material parameters and any validation results. Most *TestPaks* can be ordered for a five-day turnaround (expedited 48 hour service is also available), and include pre- and post- material modeling technical support. A few examples of what our *TestPaks* contain are presented below:

Static Loadings

Simulation Scenario	Applicable Material	CAE Material Models	Required Tests
Static small deformation: Stiffness	Metals, plastics, foams, rubbers, composite		Tensile modulus Poisson's ratio
Static large deformation: Post-yield modeling	Metals, plastics		Tensile stress-strain, modulus and Poisson's ratio

Dynamic Loadings, Crash, Drop Test

Simulation Scenario	Applicable Material	CAE Material Models	Required Tests
Crash / dynamic loading: Impact simulations of car body	Metals, plastics, composite	LS-DYNA MAT024	Tensile stress-strain at 0.01, 0.1, 1, 10, 100/s, density and Poisson's ratio; capture and modeling of post-yield behavior
Crash / dynamic loading: Impact simulations of car instrument panel- fiber filled plastics; high stiffness, brittle failure	Fiber filled plastics	LS-DYNA MAT019	Tensile stress-strain at 0.01, 0.1, 1, 10, 100/s, density and Poisson's ratio. Directional properties also needed for DIGIMAT
Crash / dynamic loading: Impact simulations of car interiors and bumpers- plastics subject to ductile failure	Ductile plastics	LS-DYNA MAT089, MAT024	Tensile stress-strain strain at 0.01, 0.1, 1, 10, 100/s, density and Poisson's ratio; capture and modeling of post- yield behavior
Crash / dynamic loading with interest in non-Von Mises failure envelopes and detailed post-yield modeling	Plastics	LS-DYNA SAMP-1	Rate dependent tensile testing, compression, shear, post yield Poisson's ratio and unloading damage curves
Crash / dynamic loading: Impact of foam seats,	Soft foams, viscoelastic foam.	LS-DYNA MAT083, MAT057	Compression tests at strain at 0.01, 0.1, 1, 10, 100/s with unloading for damage
Crash / dynamic loading: Impact of foam bumpers, energy absorbers	Crushable foams	LS-DYNA MAT063, MAT163	Compression tests at strain at 0.01, 0.1, 1, 10, 100/s with unloading for damage
Crash / dynamic loading of rubber components: Impact of bushings, rubber bumpers, shock absorbers	Rubbers	LS-DYNA MAT 181, MAT 183	Rate dependent tensile of compression tests with unloading damage curves

Hyperelasticity and non-linear NVH

Simulation Scenario	Applicable Material	CAE Material Models	Required Tests
Quasi-static large deformation of rubber-like materials with little volumetric compression: Rubber boots, door seals, tubing-	Rubbers, foamed rubbers	LS-DYNA MAT077, MAT027	Quasi-static tests in uniaxial tensile, biaxial tension or compression, planar tension or shear modes, with or without pre-cycling
Quasi-static large deformation of rubber-like materials with volumetric compression: Rubber gaskets and bushings, foam seals	Rubbers, foamed rubbers		Quasi-static tests in uniaxial tensile, biaxial tension or compression, planar tension or shear modes, with or without pre-cycling, volumetric stress-strain
NVH / dynamic large deformation of rubber: door seals, bushings	Rubber, foamed rubbers		Dynamic mechanical analysis of viscoelastic frequency sweeps at multiple preload strains

Metal Forming and Cyclic Plasticity

Simulation Scenario	Applicable Material	CAE Material Models	Required Tests
Sheet metal forming: Body panel and component forming	Metals	LS-DYNA MAT036, MAT037	Tensile stress-strain in 0°, 45°, 90° and Lankford parameters in 3 directions
Work hardening: Repeated loadings under constant displacement	Metals		Cyclic tensile/compression tests

About DatapointLabs; DatapointLabs is a center of excellence for physical properties of materials in the solid and melt state, including mechanical, rheological, thermal, pvT, DMA, impact, fatigue, and creep. Serving a client base of over 600 companies in ten manufacturing verticals, DatapointLabs tests more than 1000 materials every year.

DatapointLabs

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+1 (607) 266-0405





AVI Showcase

LANCEMORE Corporation
Tokyo, Japan

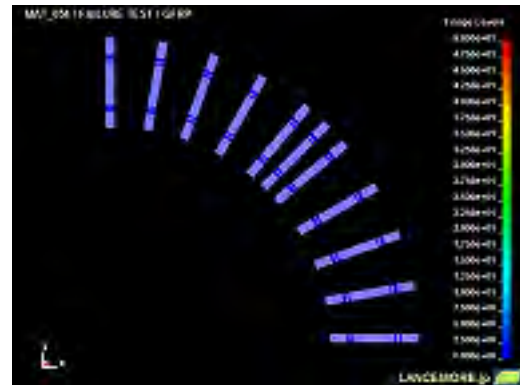
AVI: [Rubber Plane.avi](#) 2.86MB

This is an analysis of a rubber-powered airplane propeller. Tension is applied while rotating the rubber band. After rotating the rubber band 10 times, the propeller starts moving. We used *MAT_OGDEN_RUBBER.



AVI: [Tensile Test GFRP.avi](#) 2.61MB

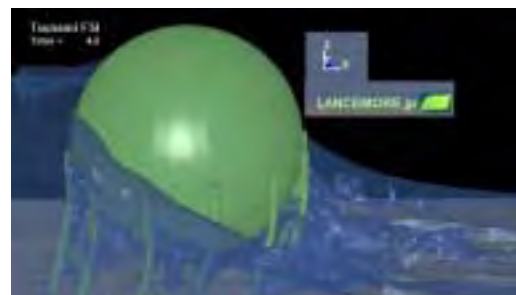
This is an analysis of an orthotropic GFRP material. The stress shown in the video is the von Mises. For all the specimens, the direction of the fiber is along the x axis. We used *MAT_ENHANCED_COMPOSITE_DAMAGE

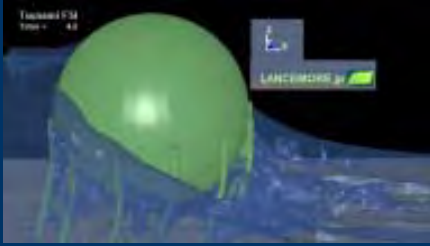


AVI: [Tsunami FSI.avi](#) 4.93MB

This is an analysis of a tsunami hitting a petroleum storage tank. The tsunami has a height of about 10 meters, and the tank is made of shell elements with fuel and its gas inside.

*INITIAL_ALE_HYDRODYNAMICS is used for the initial condition of the fuel to define its self-weight. Failure criteria are defined for the tank and we have successfully analyzed the drifting behavior of the tank.





LANCEMORE Corporation
Tokyo, Japan

LS-DYNA Consulting

Company Name:	LANCEMORE Corporation
----------------------	------------------------------

Office Location: Tokyo, Japan

Contact Information: Kihei Tsutsui, Company President
info@lancemore.jp

Web: http://www.lancemore.jp/ls-dyna/index_en.html

Phone: +81-3-3736-5767

Description: LANCEMORE Corporation is a cutting-edge, non-linear FEA consulting company, located in Tokyo, Japan. We extensively use LS-DYNA, and are pioneering new fields of FEA. Also, we sell our material input data (Japanese domestic standards only).

Consulting Services:

- Drop impact analyses of electronics and precision instruments
- Analyses of shock absorbing materials
- Collision analyses of vehicles and trains
- Safety analyses of passengers
- Manufacturing processes and technologies (incl. metal forming, plastic fabrication, glass/lens forming, etc.)
- Strength analyses of composites, plastics, and rubbers
- Analyses of nuclear power plants/buildings
- Analyses of midair, underwater, and underground explosions
- Analyses of eigenvalues and vibrations
- Analyses of heat transfers and thermal stresses
- Testing and creating material input data



Conference Paper Showcase
Paper available for download at:
DYNALOOK

LS-DYNA Durability Load Cases:

An Automated Template Driven Process Using the ANSA Task Manager

<http://www.dynalook.com/international-conf-2010/Automotive-1-3.pdf>

Y. Kolokythas –

BETA CAE Systems SA

D. Fels, Matthias Weinert

- Ford-Werke GmbH

Abstract:

Process organization and standardization are essential in a CAE turnaround cycle. In an era, where the vehicle development time is getting reduced and the number of load case analysis is getting increased, the need for automatic standard processes is increasing.

Ford-Werke GmbH and BETA CAE Systems SA are cooperating to develop streamlined, automatic processes, using the ANSA Task Manager. The goal, of these template driven processes, are to create realistic, repeatable and robust durability simulation models.

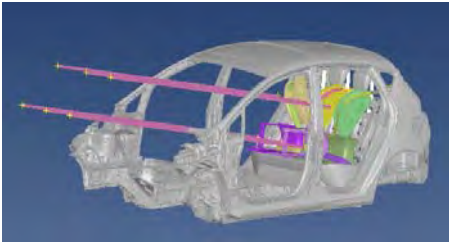
The ANSA Task Manager supervises the generation of the simulation models, while ANSA Data Management, in the background, facilitates the components management, ensuring that the

engineering teams will always work with the most up-to-date data. The simulation model set-up becomes a repeatable and user-independent procedure, safeguarding the model quality and fidelity.

Some of the load case developed to Task Manger Templates



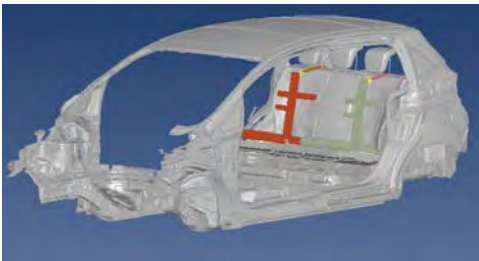
Restrain Integrity (Sled Test)



Seatbelt Static Strength (ECE R-14, FMVSS 210)

[BETA CAE Systems S.A](#)

Specializes in the development of state of the art CAE pre- and post-processing software systems. The company, focusing on meeting customers requirements, is committed to its mission.



ISOFIX (ECE R-14, FMVSS 225)



Liftgate Slam Analysis



Conference Paper Showcase
Paper available for download at:
DYNALOOK

A New Method for the Structural Optimization of Product Families

<http://www.dynalook.com/international-conf-2010/Optimization-2-3.pdf>

Larsgunnar Nilsson, Engineering Research Nordic AB
Linköping University, IEI/Division of Solid Mechanics

Michael Öman, Scania CV AB

Abstract

This paper discusses the problem of structural optimization of product families subjected to multiple load cases, evaluated by computationally costly finite element analysis. Product families generally have a complex composition of shared components that makes individual product optimization difficult as the relation between the shared variables is not always intuitive. More optimal is to treat the problem as a product family optimization problem. For product families subjected to multiple and computationally costly crash loads, however, the optimization problem takes too long time to solve with traditional methods. Therefore, a new optimization algorithm is presented that decomposes the family problem into sub-problems and iteratively reduces the number of sub-problems, decouple and solve them.

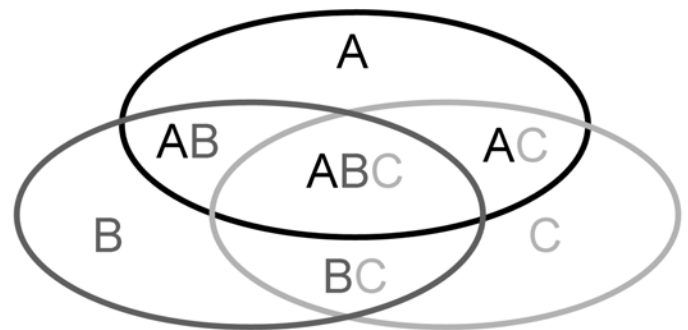


Fig 1 Illustration of how the parts can be shared in a product family of three products with generalized commonality

Engineering Research AB

We are a complete provider of CAE software and consulting services in the area of advanced Computational Mechanics and Simulation Based Design. We are the official distributor of the FE software LS-DYNA in the Nordic countries and the Baltic states.



BETA CAE Systems S.A. announces the release of μ ETA v6.7.0 with enhancements and important code corrections

EXCERPT Only – please visit the site for complete information.

<http://www.beta-cae.gr>

The official software release is comprised by the latest meta_post_v6.7.0 files dated June 20th, 2011. These replace any pre-releases and files downloaded prior to this date

New features introduced

- Launcher that opens upon start-up for selecting the Graphical User Interface layout to suit the type of Post-Processing.
- The Graphical User Interface of μ ETA has been redesigned to a modern layout with focus on maximizing the workspace area.
- The Read Results card now allows the simultaneous loading of both Scalar and Vector results.
- New User Toolbars available with every installation of μ ETA:
 1. IIHS toolbar
 2. BusRollover toolbar
 3. Bore Distortion Analysis toolbar (note that if a new cylindrical coordinate system is required, it can be created from the namesake toolbar)
 4. Cylindrical Coordinate System toolbar
 5. CFDPost toolbar
 6. CompositePost toolbar
 7. Stiffness Calculator toolbar
- Support reading CFD results from the FLUENT, OpenFOAM and STAR-CCM+ codes and displaying

results through the new, Streamlines tool.

- Support reading Abaqus 6.11 files after installing the corresponding libraries, available from the BETA CAE Systems S.A. website.
- Note also that updated Abaqus libraries for versions 6.6 and newer can be downloaded for the MS-Windows and Linux versions of μ ETA.
- It is now possible to display a model with two types of results, one in Contour plot and one in Vector plot simultaneously.
- Part Manager similar to that of ANSA, replacing the Groups card.
- Selection-assistant, opening automatically when interactive selection of entities for focusing, identifying, etc is required, with functionality is similar to that of ANSA.
- Various enhancements of the 2D Plot interface. .. and many more

Known issues resolved

- μ ETA would not read geometry correctly if blank characters and

lines existed in a NASTRAN input file.

- μ ETA would not read correctly LS-Dyna *.d3plot files of large-size (>1.9GB).
- It could happen that μ ETA would crash while reading geometry or results from certain Universal Files.
- The 2D Plot tool's Max and Min Basic Calculation function does not work correctly for complex curves.
- Saving a Postscript of a 2D Plot window with curve legend, the text within the legend would not be saved in the exported file.
- Various issues of the Report tool. and many more

For more details about the new software features, enhancements and corrections please, refer to the Release Notes document.

Compatibility: μ ETA v6.7.0 can only run with beta_lm_tools v6.0 or later. The latest beta_lm_tools version is v6.3.

Download

Where to download from:

Customers who are served directly by BETA CAE Systems S.A. may download the new software, examples and documentation from their account in our server. They can access their account through the user login link at our web site <http://www.beta-cae.gr>

Contact us if you miss your account details. The [Public] link will give you access to the public downloads area.

Customers who are served by a local business agent should contact the local support channel for software distribution details.

What to download: For the installation of the software on each platform type the following are needed:

the tar file with the respective platform name (e.g. Linux etc.), or the respective zip file for Windows and the "common" .tar or .zip file
Previous software releases can be found in the sub-directory called "old".

Documentation: Documentation is packed into the "common" file. While the "common" file is unpacked, you will find an html file that will guide you through the available pdf documents, including the Release Notes and the Users Guides.

Release Notes: Please refer to the Release Notes document for more details about the software corrections and the new features.

A detailed Release Notes document is available in pdf in the download directory and also in the /docs sub-directory within the installation directory.

Users Guide: The μ ETA Users Guide 6.5.0 is also available in pdf format.

Tutorial files' availability: The demo files necessary to cover the tutorials' documentation are available as separate downloads within the META_POST_TUTORIALS folder of the [Public] area.

Making A Difference



Mark Palmer M.D., Ph.D.
Assistant Professor, Movement Science
Assistant Professor, Biomedical Engineering
Director, Musculoskeletal Tissue Emulation Lab.

<http://www.kines.umich.edu/profile/mark-palmer-md-phd>

Areas of Interest:

Adaptation, computational modeling, mechanisms of injury, musculoskeletal health and performance

Dr. Palmer is a biomechanist whose research interests focus on the transfer of forces in musculoskeletal tissues. Currently his research focuses on developing a multilevel computational model of human skeletal muscle to elucidate the genesis and propagation of injury. He is also particularly interested in how changes in the mechanical environment of skeletal muscle tissue secondary to training, aging, genetic alteration, and disease affect functionality and susceptibility to injury. The goal of his research is to provide an integrative framework for coupling computational and experimental techniques for the purpose of developing effective interventions to improve musculoskeletal health and performance.

Research Themes:

- Adaptation, Computational Modeling,
- Mechanisms of injury,
- Musculoskeletal health and performance.

Approaches:

Dr. Palmer utilizes a combination of physiological measurements coupled with computational modeling techniques, diagnostic medical imaging, cadaveric modeling, histology and electron microscopy to gain insights into the mechanisms of injury and adaptation across multiple levels of the structural hierarchy of musculoskeletal tissues. The laboratory contains a massively parallel, mini-supercomputer cluster running state-of-the-art computational modeling and visualization tools.

Current and Past Funding Sources:

National Institutes of Health, National Institute on Aging, Merck, U-M Rackham, U-M Kinesiology.

Research Impact:

Musculoskeletal tissues serve an essential mechanical role allowing us to effectively interact with our environment.

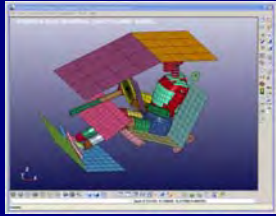
Experiments that evaluate tissue mechanics across multiple organizational levels are difficult or impossible to perform. Computational modeling provides a method to evaluate hypotheses in silico as well as integrate results from experiments across multiple levels within a tissue.

By understanding the impact of exercise, injury, aging and disease from the level of the whole body to the level of cells and proteins, we can more effectively formulate and prescribe interventions to improve recovery, performance, functional independence, and quality of life.

LS-PrePost Update

3.1 current version

3.2 development version

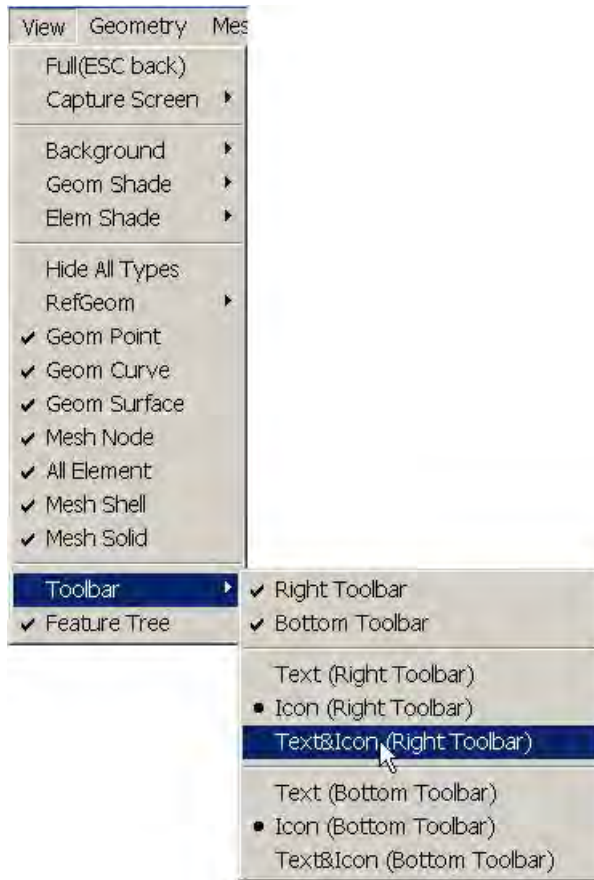


Several features in the interfaces are geared towards easier and faster operations.

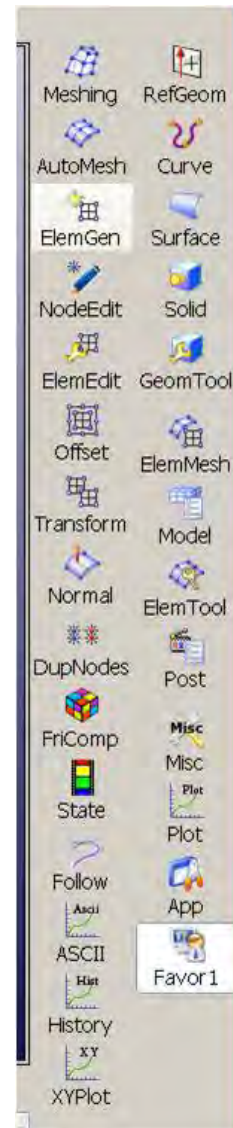
OS Support: Linux 64-bit systems, Windows 32bit and 64bits (XP, Vista, Win7)

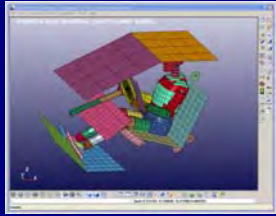
LS-PrePost Version 3.1 GUI

Tool Bar Without Text



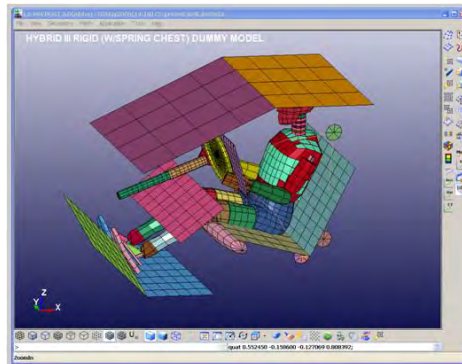
Tool Bar With Text



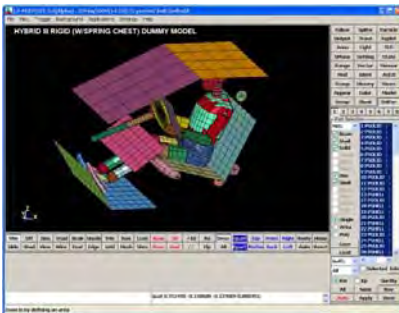


LS-PrePost Update
New Gui
Geometry Processing

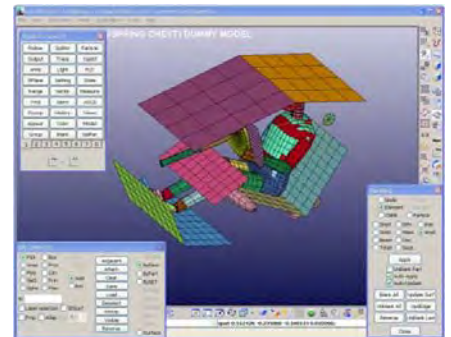
New Gui



**F11 Key To Revert To
 Old Interface**

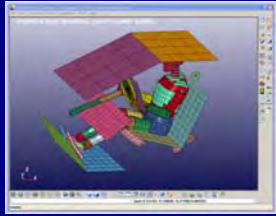


**New to Old Interface
 Transition Assistant**



LS-PrePost 3.1 Geometry processing

- Import IGES/STEP file format or create from existing FE mesh
- Export support in IGES/STEP file format
- Supports for lines, surfaces, and solids
- Shape fixing and reshaping, such as fixing hole, small edge removal, vertex reposition and deletion, small face removal or face extension, line and surface trimming, etc.
- Surface stitching to provide better auto-mesh quality



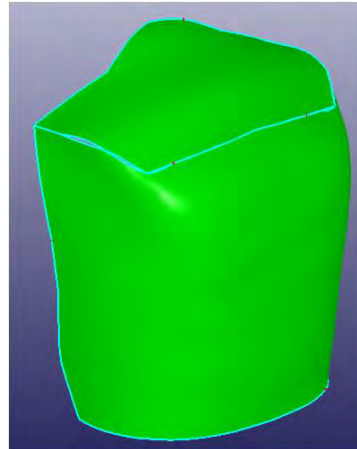
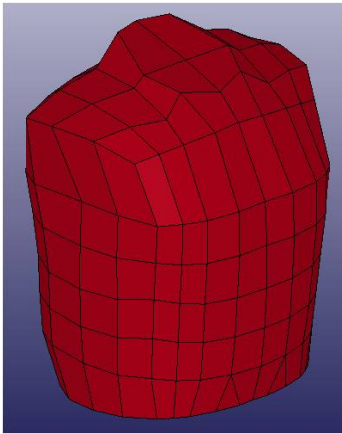
LS-PrePost Update

Mesh To Surface

AVI Import

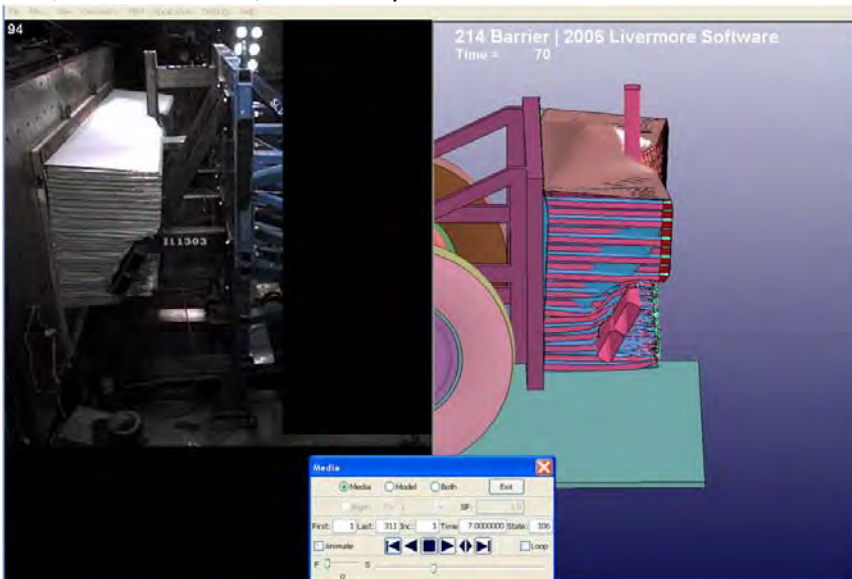
Mesh to Surface

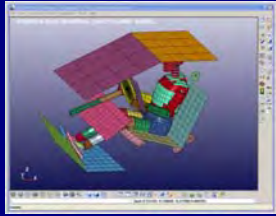
Ability to create surfaces from existing mesh, modify and remesh for new analysis



AVI Import

Import and overlay experimental videos
(in AVI format) for comparison with simulation

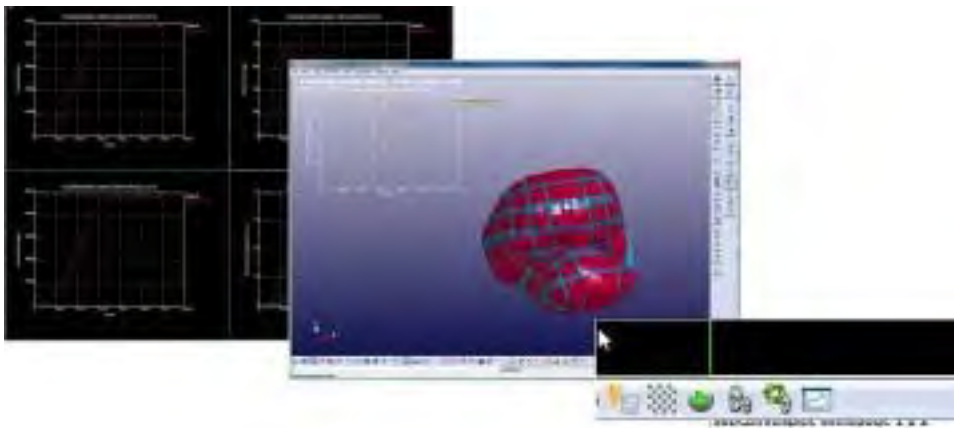




LS-PrePost Update Integrated XY Plotting

Integrated XY Plotting

XY plot can now utilize main graphics panel and Toggle between the XY plot and graphics panel. Printing can include graphics and XY plot



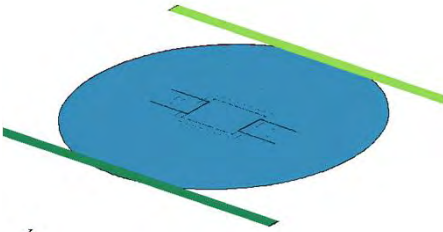
Model Compare

Model Compare				
Summary Info	Common Keywords	Model 1 only	Model 2 only	
		Model 1	Model 2	Difference % Diff
Num. Nodes		7797	7797	0 0
Num. Beam Elements		1	1	0 0
Num. Shell Elements		3114	3114	0 0
Num. Solid Elements		1836		
Num. Discrete Elements		18		
Num. Seatbelt Elements		220		
Num. Beam Parts		1		
Num. Shell Parts		41		
Num. Solid Parts		57		
Num. Discrete Parts		15		
Num. Seatbelt Parts		1		
Model Extent X		1600.75		
Model Extent Y		821.851		
Model Extent Z		1118.51		
Correlation Coef				

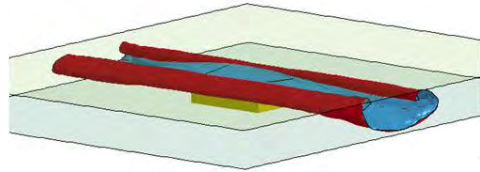
Model Compare									
Summary Info	Common Keywords	Model 1 only	Model 2 only						
Card #	SECD	ELFORM	SHEP	SOP	PROPT	GR/SKD	SCOMP	SETP	
Value 1	14	1	0	1	1	0	0	0	
Value 2	14	1	0	1	1	0	0	0	
Card #	T1	T2	T3	T4	ALOC	MARE	PROP	EDOFF	
Value 1					0	0	0	0	
Value 2					0	0	0	0	

LSDYNA Airbag folding simulation setup

LS-DYNA keyword deck by LS-PrePost
Time = 0

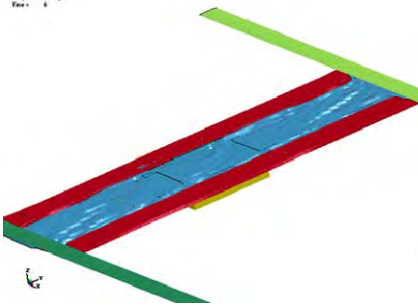


LS-DYNA keyword deck by LS-PrePost
Time = 0



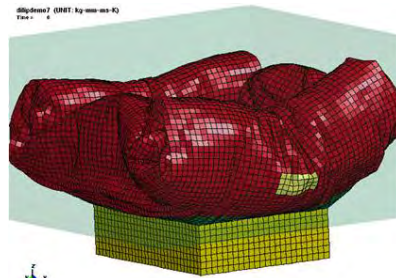
Flattening

Step3 - Folding
Time = 0



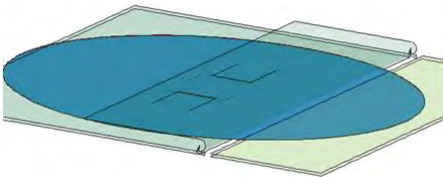
Rolling

Deployment (DEBT) by user (K)
Time = 0



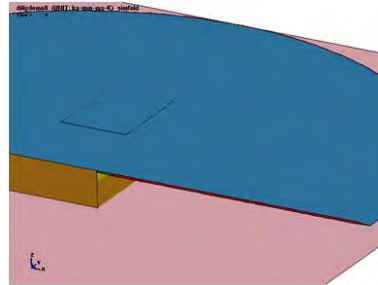
Packaging

Bending simulation tool
Time = 0



Bending

Deployment (DEBT) by user (K) CircularTuck
Time = 0



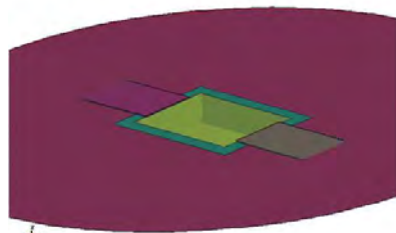
Double Tucking

Step4 - Deployment
Time = 0



Deployment Summary:

Deployment (DEBT) by user (K) CircularTuck
Time = 0



Circular Tucking

1. Improved GUI gives better look and feel.

2. Up-to-dated LS-DYNA keyword data support allows handling of the latest keyword data
3. Improved geometry data cleaning and repair capability allows user to generate better mesh without fixing the finite element mesh
4. Semiautomatic solid element meshing by using cut and sweep scheme to generate hexahedron elements.
5. Batch mode processing with pictures or AVI movie output but without graphics windows

Current and Future developments:

- Improve automatic surface meshing
- Fast graphics rendering for very large model with many thousands of parts and many states
- Model compare for post-processing data
- Programming language within command file for data manipulation
- Parallel processing – file IO,
- Very large model handling, shell normal computation, solid element internal faces eliminations, free edge computation, etc.
- Support Apple Mac OS
- Other new Applications:
 - LS-DYNA Airbag folding simulation setup
 - Die face engineering setup for metal forming
 - Drop test analysis setup
 - Provide API for other FEA code to create d3plot data file for post-processing

LS-PrePost is no fee to users – contact sales@lstc.com for information.



Authorized Distributors

LSTC's stand Alone LS-DYNA

June 2011

FEA Information Inc. is proud to be involved with the growth of LSTC's stand alone LS-DYNA to the industries, universities, students and professors in China. All sales include LSTC's LS-DYNA and the suite of software included, at no additional fees: LS-OPT, LS-PrePost, LS-TaSC and the LSTC ATD (dummy) and Barrier models.

LSTC has a direct distributorship network in China, under Dalian Fukun Technology Development Corporation. These recognized distributors form the base for a more tightly integrated relationship with LSTC developers, trainers, and special pricing for large scale transient

simulations, which typically require more than 100 cores.

Under the leadership of Dalian Fukun and LS-DYNA Manager in China, Yanhua Zhao, a few of their lead responsibilities will be to increase customer awareness of the published price list in RMB, products offered with LS-DYNA stand alone, introductory offers in China, demo licenses, customer core growth & support satisfaction. All LS-DYNA customers are encouraged to contact yanhua@lstc.com with suggestions on services, review of their current distributor, future needs, or transitioning to another distributorship.

Upgrading: FEA Information Inc. would like to let our China LS-DYNA users know that if they have previously purchased paid-up licenses of LS-DYNA from any distributor, upgrading to the most recent release simply requires paying the current year's maintenance charges, with no penalties for the years when maintenance had lapsed. Changing to a new distributor is permitted. For questions to upgrade contact Yanhua@lstc.com or your local distributor listed below:

The LS-DYNA stand alone Distributorships (alpha order) are:

ARUP China: Stephen Zhao stephen.zhao@arup.com	ETA China: Martin Ma lma@eta.com.cn	Shanghai Hengstar Techhnology Corp. Hongsheng Lu hongsheng@hengstar.com
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LSTC's Main Distributor: Dalian Fukun Technology Development Corporation

Local Contact: Shujuan Zhang - dlfkkj888@yahoo.cn

LSTC's Manager of China yanhua@lstc.com



LS-DYNA ADVANCED ALE APPLICATIONS SEMINAR

LSTC

Instructor: Ian Do, Ph.D. (for questions on class content ian@lstc.com)

Class Location: **Livermore Software Technology Corporation**
7374 Las Positas Road
Livermore, Ca, 94551

Organizer: Cathie Walton (for administrative questions cathie@lstc.com)

COURSE OBJECTIVE:

This application oriented seminar is designed to help users already familiar with LS-DYNA (and the ALE method) get more proficient at using the more complex features of ALE and fluid-structure interaction (FSI) modeling.

This is an approximately 2-day seminar (an additional half a day may be made available for discussions of users' specific models or questions, TBD). Day 1 is for reviewing some critical ALE features, FSI usage & basic concepts. In the remaining time, more complicated examples are discussed. Simulation techniques for each model will be reviewed. We will also discuss model fine-tuning and procedures for debugging models, such as ways to deal with FSI leakage. Boundary and initial conditions, mesh resolution design, etc. will also be covered. This is a hands-on training class.

A range of possible LS-DYNA ALE-FSI examples is shown below covering a wide area of applications. However,

there likely will not be enough time to cover all listed examples. So depending on the interests of the attendees, the instructor will select some examples in the list below and discuss them in detail. Examples other than those listed may also be referred to to clarify certain modeling concepts when necessary. Please indicate the examples that are of interest to you upon registration so they can be prepared. All input files to models discussed in class will be made available to the attendees for reviewing at their convenience.

PLEASE NOTE – CLASS FORMAT:

- This is a very hands-on seminar. For each example model,
- The instructor will define the physics of the problem.
- Then the attendees are expected to conceptually construct a detailed pseudo-input file for the model themselves (pencil-paper).
- Afterward, we will go over the modeling details together.
- The attendees will get out of this class as much as she/he is willing

to put into it. The hope is with enough hand notes on each pseudo model constructed, the attendees will be able to create the actually models themselves if they choose to. Please note that due to the huge amount of output for the models and long run time, the attendees will not have time to run the models in class. The goal is to be able construct each model conceptually. Result review may be done during the discussion of each model.

LIST OF POSSIBLE APPLICATIONS EXAMPLES:

Basic Concepts (< 1 day):

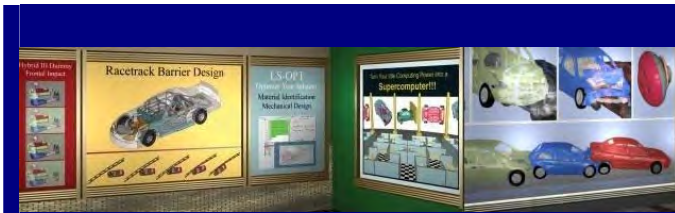
- (01) Introduction
- (02) ALE Multi-Material Group (AMMG) concepts and applications
- (03) Fluid-Structure Interaction (FSI) concepts
- (04) Initial and boundary condition set up with ALE element formulation (ELFORM=11)

- (05) Material failure modeling
- (06) Information on typical unit systems and references

Possible ALE models to be discussed

- (11) Soda can drop
- (12) Tank sloshing and impact
- (13) Extrusion
- (15) Bird strike fan blade assembly model
- (16) Projectile-target penetration modeling
- (17) Simple flow in flexible tube
- (21) Hydrostatic pressure initialization
- (22) Wave impacting floating "ship" (simple model)
- (23) Cylinder (Rocket booster) impacting water model
- (27) Tanker floating and moving through water

There may be a couple of examples related to modeling of energetic materials that are available and may be discussed depending on the attendees' interest (some security restrictions will apply). Please contact Ian if you are interested in this area of analysis.



Smooth Particle Hydrodynamics in LS-DYNA

A short course taught by: Jingxiao Xu, Ph.D.

Class Location: **Livermore Software Technology Corporation**
7374 Las Positas Road, Livermore, Ca, 94551

Organizer: Cathie Walton (for administrative questions cathie@lstc.com)

Objective:

The objective of this course is to provide engineers with the fundamental theoretical background on the SPH formulation, the available formulations, implementations, and the latest developments of the SPH method coupled with the Lagrangian formulation in LS-DYNA, teach engineers how to use the SPH options. Detailed descriptions of the data required to run LS-DYNA analysis are given. Examples are used to illustrate the points made in the lectures.

Lectures begin daily at 9:00 a.m. and run until 5:30 p.m. The classroom machines are PCs running on the Linux operating system.

COURSE CONTENTS:

SPH formulation fundamentals

- History of the Method, Variable Smoothing Length.
- Spatial Discretisation of Continuum Equations, Characteristic Lengths.
- Kernel Functions, Method Consistency, Concept of Renormalization.
- Lagrangian, Eulerian Forms of SPH, SPH/Lagrangian Coupling.

Practical examples of SPH and SPH/Lagrangian coupling

- General Capabilities/Applications.
- Details of an Example: Control Input, Material, Sections, Parts, Outputs.
- Boundary Conditions, Contacts, SPH/Lagrangian Coupling Options.
- LS-PREPOST: Creation of SPH Particles, Visualization of SPH Particles.



CaféNews
MCAD news on your desktop
<http://www.mcadcafe.com/>

It has been one year since I introduced our readers to MCAD Cafe.com's CaféNews and over this past year not only have I read it, but I've watched it grow in popularity, articles, and news for the industry.

For those of you not familiar with CaféNews News I'd like to bring it to your attention. First, it is not associated with FEA Information Inc. but I have found it a valuable resource and you should look into subscribing and visiting their website. CaféNews and the websites are owned and operated and copyright to Internet Business Systems, Inc.

Two benefits of their desktop delivery is that you may choose how often you want to receive your copy of CafeNews. Additionally, you can select whether you want your version as an HTML page, or in text only version. Of course, as a courtesy, you can change your preferences, or unsubscribe from the service at any time by simply clicking a link on each delivered issue.

I have found them to be extremely technical with articles, blogs, commentaries by leading experts and professionals in the fields for industry news, emerging products, technical articles, and information

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http://www10.mcadcafe.com/nl/newsletter_subscribe.php

Website

Among their many website features:

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- Audio Interviews
- Newsgroups

And, within the next 2 weeks MCAD Cafe and its CafeNews will launch their Design Showcase, featuring visual product development tours, from inception to manufacturing.

More Information, Contact:

David Heller
Managing Director
MCAD Cafe.com
408-850-9201
David.Heller@MCAD Cafe.com



Aerospace Information

<http://www.aerospaceinformation.com>

The picture of the month does not depict use of any software. It is chosen, based on the FEA Inc Team's interest in aerospace dynamics, aviation history, or interest. If you wish to have us show a plane, from any country, feel free to send your suggestion to mv@feainformation.com

Unveiling of first "Mercedes-Benz Style" product in Geneva

EC145 "Mercedes-Benz Style" helicopter from Eurocopter makes its world premiere.

The first product from "Mercedes-Benz Style" is ready for take-off: The EC145 "Mercedes-Benz Style" helicopter from Eurocopter celebrates its world premiere on 17th May, 2011 at the European Business Aviation Convention & Exhibition 2011 (EBACE) in Geneva, after which it will be handed over to a European customer. Mercedes-Benz designers created the interior, which is notable for its outstanding versatility and exquisite materials. The EC145 "Mercedes-Benz Style" is tailor-made for luxury-class business and private travel.

"We are very pleased to have realized the first product of 'Mercedes-Benz Style' with Eurocopter," said Prof. h.c. Dr. Gorden Wagener, head of design at Mercedes-Benz. "The interior design of the EC145 'Mercedes-Benz Style' helicopter represents the classic passion of the Mercedes-Benz design language and fulfils the very highest expectations in terms of elegance, luxury and comfort."

The luxurious interior design was created in the Mercedes-Benz Advanced Design

Studio in the Italian city of Como and is inspired by the luxury-class saloons created by the brand with the three-pointed star. The EC145 "Mercedes-Benz Style" offers deluxe materials, elegant woods, and ambient lighting familiar from the S and E-Class that can be adjusted to a number of different colour and brightness settings, as well as spacious multi-function boxes with various equipment options.

Moreover, the designers have placed a great deal of emphasis on variability. The passenger cabin is incredibly versatile, making the EC145 "Mercedes-Benz Style" ideal for a diverse range of travel needs – from business or family travel, to leisure and sporting trips. All seats are fixed to rails and can be rearranged very easily in a number of different arrangements for four to eight passengers, or removed altogether in order to create space for luggage. The spacious load area also offers a high degree of flexibility with an extensive range of anchoring options on the floor and walls.

The EC145 is the perfect match for "Mercedes-Benz Style", as this turbine-powered aircraft is at the top of its class in the medium-sized, twin-engine helicopter category. It combines Eurocopter's leading-edge developments

in cockpit design and avionics, while also incorporating a hingeless rotor system and enhanced rotor blades that reduce sound and vibration levels. More than 400 EC145s have been delivered around the globe for a full range of operations and is the only helicopter of its type that can seat up to eight passengers.

"Only one year after Eurocopter presented the EC145 'Mercedes-Benz Style' concept at EBACE 2010, we now are unveiling the first aircraft and can already announce the initial sale to a European corporate operator," said Olivier Lambert, Eurocopter's Senior Vice President Sales and Customer Relations. "These achievements confirm Eurocopter's successful approach in developing products that meet the demanding expectations of executive and private customers worldwide."

About "Mercedes-Benz Style"

In addition to styling iconic automobiles, the designers at Mercedes-Benz also work on product design in other fields. The portfolio of "Mercedes-Benz Style" division comprises not only transport-

related products, but also furniture and lifestyle products, as well as industrial design. The business model for

"Mercedes-Benz Style" incorporates contract work - whereby the design rights are sold to the product manufacturer - and the granting of design licences.

Contact:

Tobias Müller, Phone: +49 (0)711 17-7 73 68, tobias.mueller@daimler.com

Norbert Giesen, Phone: +49 (0)711 17-7 64 22, norbert.giesen@daimler.com

Stéphane Chéry, Phone: +33 (0)4 42 85 60 51, Mob: +33 (0)6 23 93 71 23, stephane.chery@eurocopter.com

Pascale Fleury, Phone: +33 (0)4 42 85 62 38, Mob: +33 (0)6 32 54 05 02, pascale.fleury@eurocopter.com

Further information about Mercedes-Benz is available online:

www.media.daimler.com



Employment Opportunity

ARUP

Oasys LS-DYNA Environment

For Information Contact : Carol.Lloyd@arup.com

Job Description	
Group	Technology Group
Job title	Software Developer
Job grade	EDT 3/4
Job brief/ purpose	<p>The main part of the job is writing software for the “Oasys LS-DYNA Environment”, e.g. Primer. This software is sold commercially; the income from sales funds a continuous program of improvements and new releases. The software is an expert, niche product; it is the team’s deep understanding of the needs of customers that gives the software its commercial edge. The post-holder will be expected to develop such understanding over time.</p> <p>The software development team sits within Advanced Technology & Research, performing a wide range of consultancy work based largely on numerical simulation.</p>
Relationships	The post holder will liaise continuously with other members of the software development team who are working on the same products. The team is led by an Associate Director and a Director, with whom the post holder will be in daily contact.
Responsibilities	<p>The post holder will take responsibility for particular functions within the software, including some new functions that the post-holder will develop, as well as contributing to the general development effort (e.g. debugging, testing, and contributing to the design of new features).</p> <p>The role also includes some customer support of the products with which the post holder is familiar.</p>



Employment Opportunity

ARUP

Oasys LS-DYNA Environment

<p>Scope</p>	<p>This post is newly created in response to growing sales and demand.</p> <p>Support will be given to achieve chartered status with an appropriate Institution.</p> <p>The post offers scope in the short term for increasing levels of responsibility within the software team. For example, responsibility for software releases, and for particular software products. There will also be opportunities to supervise junior staff, for example during testing, and there is the possibility of involvement in managing developers overseas. In the longer term, the specialist nature of the work does not constitute a barrier to promotion within Arup.</p>
<p>Contacts</p>	<p>The post-holder will have regular contact with other members of the AT&R Group within Campus, Japan, India and the USA and external clients who are users of the software. The post-holder will also have frequent contact with customers, for example answering support questions, and at meetings to understand customer needs.</p>
<p>Environment</p>	<p>The post is within the Advanced Technology & Research Group at the Arup Campus, a purpose-built office accommodation on the outskirts of Solihull, in the West Midlands, near junction 4 of the M42 and Widney Manor Station. The Campus is a non-smoking environment.</p>

For Information Contact: : Carol.Lloyd@arup.com



Solutions

Available Books

Available From
Amazon

	<p>Finite Element Analysis Theory and Application with ANSYS (3rd Edition)</p>		<p>Arbitrary Lagrangian-Eulerian and Fluid Structure Interaction.</p>
	<p>Isogeometric Analysis: Toward Integration of CAD and FEA</p>		<p>NURBS for Curve & Surface Design: From Projective Geometry to Practical Use</p>
	<p>A First Course in Finite Elements</p>		<p>Engineering Numerical Analysis</p>
	<p>Go To Book at Amazon</p>		



Solutions

Available Books

Available From
Amazon

Meshless
Methods in
Solid
Mechanics

[Meshless Methods in Solid Mechanics](#)



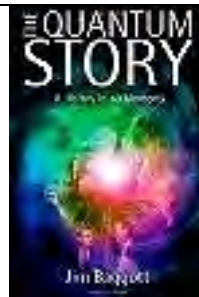
[Principles of Geotechnical Engineering](#)



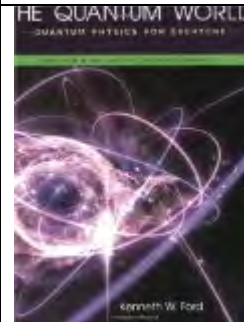
[Geotechnical Earthquake Engineering](#)

Microflows and
Nanoflows
Fundamentals and Simulation
George Karniadakis
Ali Beskok
Narayan Anand

[Microflows and Nanoflows](#)



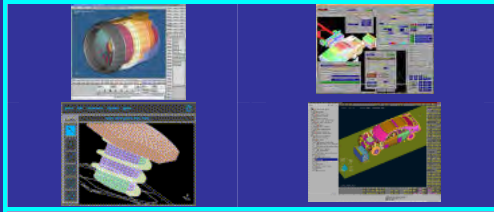
[The Quantum Story: A History in 40 Moments](#)



[The Quantum World: Quantum Physics for Everyone](#)

INTRODUCTION TO
QUANTUM
MECHANICS
SIXTH EDITION
DAVID J. GRIFFITHS

[Introduction to Quantum Mechanics \(2nd Edition\)](#)



Solutions

Pre-Processing
Post Processing
Model Editing

A preprocessor is a program that processes its input data to produce output. This data is then used as input to another program.

BETA CAE Systems S.A.

<http://www.beta-cae.gr/>

Provides complete CAE pre- and post-processing solutions. ANSA, the world wide standard pre-processor and full product modeler for LS-DYNA, with integrated Data Management and Task Automation. μ ETA, with special features for the high performance an effortless 3D & 2D post-processing of LS-DYNA results.

Engineering Technology Associates, Inc.

<http://www.inventiumsuite.com>

PreSys is an advanced Pre/Post Processor. PreSys is a full-featured, core solution that can be used on its own or with a variety of available add-on applications. The system offers advanced automeshing tools to provide the highest quality mesh with little CAD data preparation. It also features a scripting interface and model explorer feature for in-depth data navigation.

Oasys, Ltd

<http://www.oasys-software.com/dyna/en/>

Oasys Primer is a model editor for preparation of LS-DYNA input decks. - Oasys D3Plot is a 3D visualization package for post-processing LS-DYNA analyses using OpenGL® (SGI) graphics.

JSOL Corporation

<http://www.jsol.co.jp/english/cae/>

JVISION is a general purpose pre-post processor for FEM software. Designed to prepare data for, as well as support, various types of analyses, and to facilitate the display of the subsequent results.

Livermore Software Technology Corporation

<http://www.lstc.com>

LS-PrePost is an advanced interactive program for preparing input data for LS-DYNA and processing the results from LS-DYNA analyses.



Solutions Software

ETA – DYNAFORM & VPG

<http://www.eta.com>

Includes a complete CAD interface capable of importing, modeling and analyzing, any die design. Available for PC, LINUX and UNIX, DYNAFORM couples affordable software with today's high-end, low-cost hardware for a complete and affordable metal forming solution.

ETA – VPG

<http://www.eta.com>

Streamlined CAE software package provides an event-based simulation solution of nonlinear, dynamic problems. eta/VPG's single software package overcomes the limitations of existing CAE analysis methods. It is designed to analyze the behavior of mechanical and structural systems as simple as linkages, and as complex as full vehicles.

OASYS software for LS-DYNA

<http://www.oasys-software.com/dyna/en/>

Oasys software is custom-written for 100% compatibility with LS-DYNA. Oasys PRIMER offers model creation, editing and error removal, together with many

specialist functions for rapid generation of error-free models. Oasys also offers post-processing software for in-depth analysis of results and automatic report generation.



Solutions Software

ESI Group Visual-CRASH For DYNA

<http://www.esi-group.com>

Visual-Crash for LS-DYNA helps engineers perform crash and safety simulations in the smoothest and fastest possible way by offering an intuitive windows-based graphical interface with customizable toolbars and complete session support. Being integrated in ESI

Group's Open VTOS, an open collaborative multi-disciplinary engineering framework, Visual-Crash for DYNA allows users to focus and rely on high quality digital models from start to finish. Leveraging this state of the art environment, Visual Viewer, visualization and plotting solution, helps analyze LS-DYNA results within a single user interface.

BETA CAE Systems S.A.– ANSA

<http://www.beta-cae.gr>

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

<http://www.beta-cae.gr>

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
Cloud Service
SGI
HPC Cloud Cyclone™

Complete Information can be found on the SGI Website including:

- Cyclone™ and LS-DYNA® Success Story
- IDC White Paper - Cyclone Supported Applications
- Cyclone Usage Diagram

http://www.sgi.com/products/hpc_cloud/cyclone/index.html

Cyclone™ is the world's first large scale on-demand cloud computing service specifically dedicated to technical applications. Cyclone capitalizes on over twenty years of SGI HPC expertise to address the growing science and engineering technical markets that rely on extremely high-end computational hardware, software and networking equipment to achieve rapid results. Cyclone supports a number of leading applications partners and five technical domains, including computational fluid dynamics, finite element analysis,

computational chemistry and materials, computational biology and ontologies.

Two Service Models: Cyclone is available in two service models: Software as a Service (SaaS) and Infrastructure as a Service (IaaS). With SaaS, Cyclone customers can significantly reduce time to results by accessing leading-edge open source applications and best-of-breed commercial software platforms from top Independent Software Vendors (ISVs). The IaaS model enables customers to install and run their own applications.

LS-DYNA® Implicit Hybrid Technology on Advanced SGI® Architectures*

White Paper pdf format is at URL: <http://www.sgi.com/pdfs/4231.pdf>

Olivier Schreiber, Scott Shaw, Brian Thatch - SGI Application Engineering
Bill Tang, - SGI System Engineering



**Information Solutions
FEA Participants
Site Directory**

LS-DYNA On Demand Additional Core (cloud) Services

US - SGI	http://www.sgi.com/products/hpc_cloud/cyclone/index.html
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LS-DYNA Information Sites

LS-DYNA Application/Capability	http://www.ls-dyna.com/
LS-DYNA LS-DYNA Benchmarks	http://www.topcrunch.org/
LS-DYNA Publications	http://www.dynalook.com/
LS-DYNA Consulting Companies	http://www.ls-dynaconsulting.com/
LS-DYNA Examples	http://www.dynaexamples.com/
LS-OPT Support	http://www.lsoptsupport.com
LS-OPT User Group	http://groups.google.com/group/lsopt_user_group
LS-PrePost Support	www.lstc.com/lspj
LS-DYNA Support	http://www.dynasupport.com/

ATD – Pedestrian – Barrier Models

ATD LSTC Models:	http://www.lstc.com/models
ATD LSTC Mailing List	atds@lstc.com
ATD Models - DYNAMore	http://dummymodels.com
Pedestrian Impact Model - ARUP	http://oasys-software.com/en/fe-models/pedestrian.shtml
Cellbond Barrier Models - ARUP	http://oasys-software.com/en/fe-models/barrier.shtml
RCAR Barrier Model - ARUP	http://oasys-software.com/en/fe-models/rcar.shtml



Information Solutions Site Directory

Additional LS-DYNA Information Sites

High Strain Rate Testing of Advanced High Strength Steels	http://thyme.ornl.gov/ASP_Main/crashtests/crashtests_main.cgi
High Strain Rate Characterization of Mg Alloys	http://thyme.ornl.gov/Mg_new
(FEM) models of semitrailer trucks for simulation of crash events	http://thyme.ornl.gov/FHWA/TractorTrailer
Single Unit Truck crash model documentation	http://thyme.ornl.gov/FHWA/F800WebPage

**Call for Papers/Announcement
June 3-5, 2012
Dearborn, Michigan, USA**



**12th International LS-DYNA®
Users Conference**

Livermore Software
Technology Corp.

<http://www.ls-dynaconferences.com>

The 12th International LS-DYNA® Users conference will be held in Dearborn, Michigan, USA, June 3-5, 2012.

The conference will provide an ideal forum for LS-DYNA worldwide users to share technology. Providing a venue to learn new features, and applications of LS-DYNA, LS-OPT, LS-PrePost, LS-TaSC, LSTC Dummy and Barrier Models, as well as the many software and hardware alliances of LSTC's products.

All of our users from industry, research and academia are invited to present a paper.

The exhibition area hosts the latest software and hardware developments providing you the opportunity to speak directly with the company about their products.

Call For Papers

Application areas being accepted for submission:

- Aerospace
- Automotive Crashworthiness
- Ballistic/Penetraion
- Bimechanics
- Civil Engineering
- Compressible Fluid Dynamics
- Electro Magnetics
- Heat Transfer
- Impact/Drop Testing
- Manufacturing Processes
- Metal Forming
- Modeling Techniques
- Nuclear Applications
- Occupant Safety
- Seismic Engineering
- Ship Building
- Transportation
- Virtual Proving Ground

Paper Submission*

For submission details contact papers@lstc.com

Sponsorship

For sponsor and/or Exhibit booth information contact conference@lstc.com

Registration Fees*

Conference Only \$450
Training Only \$450
Conference/Training \$900

Hotel Accomodations

Conference attendees will be able to reserve a discounted room rate. Contact: conference@lstc.com

*The presenter of each accepted paper will receive free admission to the conference, provided that the presenter register for a room, at the Hyatt Regency, Dearborn under LSTC Conference registration

Suggested Post-Conferences Courses: Impact/Dummies & Barriers - Heat Transfer & hot stamping – ALE – EFG – SPH - Polymeric Material with LS-DYNA – Ballistics/Penetration – contact conference@lstc.com with questions/course requests.

Contact: conference@lstc.com

e-mail: papers@lstc.com **tel:** 925-449-2500 **Fax:** 925-961-0806

Livermore Software Technology Corp., 7374, Las Positas Rd, Livermore, CA 94551 USA

Conference Venue

Hyatt Regency Dearborn
600 Town Center Drive
Dearborn, MI
48126-2793, USA
www.dearborn.hyatt.com

IMPORTANT DATES

Abstract Deadline

Nov. 11, 2011

Acceptance Notification

January 5, 2012

Final Paper Deadline

March 1, 2012

AGENDA

Sunday, June 3

Registration
Pre-Conference Seminars
Reception/Entertainment

Monday, June 4

Registration
Plenary Presentations
Keynote Presentations
Technical Sessions
Exhibit Area
Banquet/Entertainment

Tuesday, June 5

Registration
Exhibition Area
Presentations:

- John O. Hallquist
- Sponsors

POST CONFERENCES COURSES

Wed/Thurs June 6-7



ENGINSOFT INTERNATIONAL CONFERENCE 2011

CAE Technologies for Industry

EnginSoft INTERNATIONAL CONFERENCE 2011

CAE Technologies for Industry

and ANSYS Italian Conference

Fiera Verona – Verona, Italy

20–21 October 2011

Call for Papers

Mark your diary for one of the most important events in the global CAE Calendar!

The 2 parallel Conferences present a wide range of Virtual Prototyping applications, with a large presence of both technical experts and business decision makers.

The event organizers welcome contributions which describe applications of CAE Technologies in:

- mechanics,
- computational fluid dynamics,
- electromagnetism,
- acoustics,
- structural engineering,
- optimization,
- manufacturing process simulation,

- durability, fatigue,
- crashworthiness,
- CAD/CAE integration

and for the industrial sector:

- from automotive to electronics,
- from aerospace/defense to the food and beverage industry

A unique occasion to promote your work.

Papers can be submitted on-line.

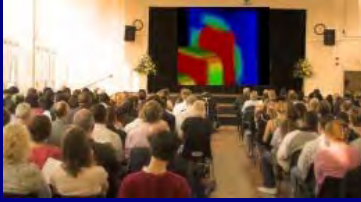
Deadline for abstract submission:

30th June 2011

Deadline for final paper submission:

30th September 2011.

Visit www.caeconference.com to plan your attendance, presentation and for more information about the exhibition.



Training Courses

CADFEM GmbH

The Complete Training Courses Offered Can Be Found At: <http://www.cadfem.de>

Please check the site for accuracy and changes.

Among the many course offering are the following:

Explicit structural mechanics with ANSYS Workbench and LS-DYNA

Beside the trainings on all aspects of short time dynamics we offer also various seminars on new methods available in LS-DYNA.

- Seminar: Introduction to explicit structural mechanics with ANSYS LS-DYNA and LSTC LS-DYNA
- Seminar: Material modeling with LS-DYNA
- Seminar: Simulation of composites with ANSYS Composites PrepPost and LS-DYNA
- Online-Seminar: Contact modeling with LS-DYNA
- Online-Seminar: Modeling joints with LS-DYNA
- Seminar: Crash simulation with LS-DYNA

optiSLang

Parametric simulation and optimization with optiSLang
optiSLang is one of the most popular solver for optimization and robust design analyses

Online-Seminar: Advanced parametric simulation with ANSYS Workbench and optiSLang

AnyBody

With AnyBody it is possible to simulate the kinematics of a human body like computing muscle forces for example.

- Seminar: Introduction to simulation of joint- and muscle- forces with AnyBody
- Seminar: Efficient coupling of AnyBody with ANSYS Workbench



Training Courses

Livermore Software
Technology Corporation

The Complete Training Courses Offered Can Be Found At <http://www.lstc.com>
Training Coordinator: Cathie Walton Cathie@lstc.com

Start Date	Location	Course
07/13/11	CA	ALE/Eulerian & Fluid Structure Interaction
08/01/11	CA	LS-PrePost (no charge with Intro to LS-DYNA)
08/02/11	CA	Intro to LS-DYNA
08/23/11	MI	Advanced ALE Applications
09/06/11	CA	Implicit
09/08/11	CA	Advanced Options in LS-DYNA
09/12/11	MI	LS-PrePost (no charge with Intro to LS-DYNA)
09/13/11	MI	Intro to LS-DYNA
09/19/11	CA	Contact in LS-DYNA
09/20/11	MI	LS-OPT

Courtesy Posting of Classes Offered by
Paul Du Bois and Len Schwer:

Concrete & Geomaterials

10/4/2011 10/5/2011 Tue-Wed

Modeling & Simulation

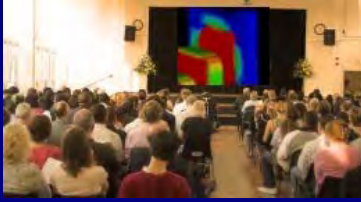
10/6/2011 10/7/2011 Thurs-Fri

Blast Modeling

10/11/2011 10/12/2011 Tue-Wed

Penetration Modeling

10/13/2011 10/14/2011 Thurs-Fri



Training Courses

Engineering Research AB ERAB

The Complete Training Courses Offered Can Be Found At <http://www.erab.se/courses/>
Please check the site for accuracy and changes.

LS-PrePost 3, introduction
September 12, 2011

LS-DYNA, introductory
September 13, 2011

LS-DYNA, Adv. training in impact
analysis
September 20, 2011

LS-OPT, Optimization and
robust design
October 4, 2011

LS-DYNA, implicit analysis
October 11, 2011

ANSA & Metapost, Introductory
October 25, 2011

LS-OPT, Optimization and robust design
November 14, 2011



Training Courses

Alliance Services Plus (AS+)

The complete Training Courses offered can be found at
<http://www.asplus.fr/ls-dyna>

Please check the site for accuracy and changes.

Among the many course offerings are the following:

Other regular courses (in Paris) ...

LS-DYNA Unified Introduction Implicit &
Explicit Solver
November 21-24

LS-OPT & LS-TaSC Introduction
October 19-20

Switch to LS-DYNA
October 5-6

Switch from LS-PrePost 2.X to 3.X
September 28
December 14

LS-DYNA Advanced Implicit Solver
September 27

LS-DYNA ALE / FSI
October 17-18

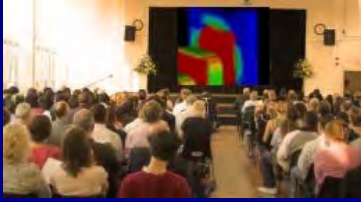
LS-DYNA SPH
November 8-9

LS-PrePost 3.0 – Advanced meshing
capabilities
September 29
December 15

LS-DYNA User Options
to be announced

LS-DYNA – Plasticity, Damage & Failure
– By Paul DU BOIS
October 3-4

LS-DYNA – Polymeric materials – By Paul
DU BOIS
December 12-13



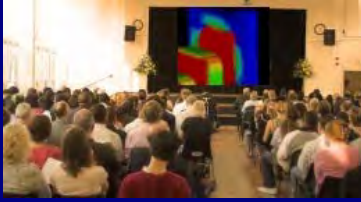
Training Courses

Shanghai Hengstar
Technology Co. Ltd.

Email: info@hengstar.com

Phone: +86-021-61630122

2011	5	6	7	8	9	10	11	12
An Introduction to LS-DYNA(High Level)								
Crashworthiness Simulation with LS-DYNA								
Passive Safety and Restraint Systems Design								
LS-Prepost, LS-DYNA MPP, Airbag Simulation with LS-DYNA								
Pedestrian Safety and Passive Safety Simulation with LS-DYNA								
Crashworthiness Theory and Technology, Introduction of LS-OPT which is based on LS-DYNA								
Concrete & Geomaterial Modeling, Blast Modeling with LS-DYNA								
Frontal Restraint Systems according to FMVSS 208 and Euro NCAP								
Crashworthy Car Body disinterested, Simulation, Optimization								
Hot stamping with LS-DYNA								



Training Courses

ETA

<http://www.eta.com> for training dates and additional information

Introduction to DYNAFORM

Introduction to DYNAFORM for sheetmetal forming applications. Includes Die Face Engineering and Blank Size Estimation tutorials.

Duration: 2 day course

Using PreSys with NISA

An introduction to PreSys for finite element modeling and the NISA finite element solver. This course will teach the student how to use PreSys to create their finite element model, set up a NISA simulation and review the results of the simulation. Workshop problems will be used to demonstrate of the principles discussed in the course material.

Duration: 1 day course

Introduction to PreSys

An introduction to the PreSys software for finite element modeling and results visualization. This course provides the basics for creating finite element model from CAD data, property definition and analysis preparation and

visualization of simulation results. Workshop problems will be used to demonstrate all of the principles discussed in the course material.

Duration: 1 day course

Introduction to LS-DYNA

This course is intended for the new user, or those who might like a refresher on the basics of creating, running, debugging and analyzing an LS-DYNA model. The course will be in a lecture/workshop format, with the user running example models and post-processing the results.

Duration: 2 day course

Please contact support@eta.com This e-mail address is being protected from spambots. You need JavaScript enabled to view it , call (248) 729-3010, or register online to reserve a seat at the desired training session. Space is limited, so please reserve a seat as early as possible.



Question 2

LS-DYNA Users

Challenge Your Knowledge

DYNAmore GmbH

Carrying out a FE simulation using an explicit time integration method, one of the main issues for stability is the upper limit of the time step, the so-called critical time step. This critical time step depends on a characteristic length of the elements and the wave speed, which is determined by the density and the stiffness of the material. The limitation of the time step is also known as the Courant-Friedrichs-Lewy (CFL) condition.

It is a necessary condition to make useful simulations. You may check detail in literature or at:

<http://www.dynasupport.com/tutorial/ls-dyna-users-guide/time-integration>.

By default, the appropriate time step is determined by LS-DYNA automatically. In addition, LS-DYNA allows the user to modify the time step size with several parameters.

- A. Please download the LS-DYNA input file beam.k
(<http://www.dynasupport.com/links/fea-information-examples/beam.k>)
- B. Answer the following questions.

The exercise intends to explain the CFL condition and its application in LS-DYNA.

- 1.) Compute the critical time step of the beam and compare your result with the "smallest timestep" in LS-DYNA. Why is there a difference?
- 2.) How can you prompt LS-DYNA to output the analytical solution?
- 3.) Carry out a simulation, where $DT2MS=-1.0E-3$. Why is this time step not considered?
- 4.) How can you define a maximum time step size?
- 5.) What happens, if you carry out a simulation without mass scaling and $TSSFAC=1.1$?



Answer to Question #2

LS-DYNA Users

Challenge Your Knowledge

Solutions:

1a.) analytical:

$$dt = l \cdot \sqrt{\text{density} / \text{youngs_modulus}} = 10.0 \cdot \sqrt{0.785E-5 / 210.0} = 0.19334E-02$$

LS-DYNA: $dt = 0.17372E-02$

1b.) Scale factor for computed time step is by default TSSFAC=0.9

2.) Include *CONTROL_TIMESTEP keyword and define TSSFAC=1.0

3.) LS-DYNA chose the greatest possible time step and the computed critical time step is greater than the one defined via DT2MS.

4.) Define a load curve that limits the maximum time step size
(*CONTROL_TIMESTEP, LCTM)

5.) Error termination due to "out-of-range (rotational) velocities" --> simulation gets unstable



Question 3

LS-DYNA Users

Challenge Your Knowledge

Quiz:

Taking a closer look on the material models in LS-DYNA, one can distinguish between two different kinds of material laws. On the one hand, one can find material laws, which relate stresses to strains. Keeping thereby in mind that there exist several stress and strain measures, care must be taken on the interpretation of force vs. displacement or stress vs. strain diagrams. For example, the basis for a parameter identification of an elastoplastic material model in LS-DYNA is typically a true stress true strain curve, cf. <http://www.dynasupport.com/tutorial/computational-plasticity>. On the other hand, there exist material laws, which relate directly forces to displacements or moments to rotations, respectively. These types of material laws are known as discrete material laws and require other element formulations in LS-DYNA, cf. the keyword *SECTION_DISCRETE or beam element form six.

Please download the LS-DYNA input file beam2.k (http://www.dynasupport.com/links/fea-information-examples/beam2.k/at_download/file) and answer the following questions. The exercise intends to give a better understanding of the above mentioned two classes of material formulations:

1. Take a look on the force vs. displacement relationship of the beam. Why can you find a nonlinear relation between these two variables, although an elastic material law is chosen? How can you check this?
2. Reference within the part keyword of the beam the material and section keywords with the id two. Carry out the simulation and take a further look on the force vs. displacement curve. Why is there a linear relation between these two variables now?
3. Define a further node at the origin of the coordinate system and replace the second node of the beam by this new node. Carry out a simulation and take a look on the force vs. displacement curve of the beam. Why can you observe no difference in comparison with the beam of finite length?
4. Take a look on the critical time steps of the discrete beams with and without a certain length. Why can you find the same value for both configurations?
5. Divide the mass of the beam in halves. What is the consequence for the critical time step?



Answer 3

LS-DYNA Users

Challenge Your Knowledge

Solutions:

- 1.) *MAT_ELASTIC provides a material formulation between true stresses and strains and not between engineering stresses and strains or forces and displacements. If you plot true stresses vs. strains, you will find the linear relation between them.
- 2.) Now a discrete material law is used, whereby the force is directly related to the displacement.
- 3.) As a discrete material law relates forces to displacements and not to strains, where generally the displacement is related to the length of an element, the resulting force depends only on the displacement between the two nodes of the beam element and not on the length between them.
- 4.) The critical time step of an element with a discrete material law is independent of the length of the element.
- 5.) The critical time step decreases. The critical time step of a element with an discrete material law depends on the mass and the stiffness.



Students

Formula One

If your University is working on a Formula One please consider listing it here. Send the information to mv@feainformation.com

Brigham Young University:



PACE Formula One Race Car Project begins a new year. The prior year was a success of many collaborative efforts. C. Greg Jensen, Professor, Mechanical Engineering, Brigham Young University and his students studied crash analysis and built a model. Among the collaboration Suri Bala led the LS-DYNA effort with his software, D3VIEW, an online collaboration tool for LS-DYNA projects

Last Year's Article http://www.lstc.com/pdf/a_pace_car.pdf

Slovak University of Technology

Stuba GreenTeam is a racing team representing Slovak University of Technology in Bratislava. Our goal is to develop, design and manufacture a racing, participate on Formula Student electric and take the challenge to compete other racing teams from all over the world. www.sgteam.eu -



North America

Finite Element Analysis Consulting - Consultants

LS-DYNA Consulting FEA Consultants

- Canada** Metal Forming Analysis Corporation - MFAC -
 Contact: galb@mfac.com
- USA** Engineering Technology Associates, Inc
 Contact: sales@eta.com
- USA** SE&CS
 Contact: len@schwer.net
- USA** Predictive Engineering
 Contact: george.laird@predictiveengineering.com
- USA** CAE Associates
 Contact: info@caeai.com
- USA** AEG Product Engineering Services
 Contact: support@engineering-group.com
- USA** APACS Services Inc.
 Contact: apacs@comcast.net



EUROPE

Finite Element Analysis Consulting - Consultants

LS-DYNA Consulting FEA Consultants

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Contact: ls-dyna@cadfem.de

Germany DYNAMore
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ITALY EnginSoft SpA
Contact: info@enginsoft.it

Netherlands Infinite Simulation Systems, B.V
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Sweden Engineering Research AB
Contact: sales@erab.com

UK OVE ARUP & PARTNERS
Contact: brian.walker@arup.com



Asia Pacific

Finite Element Analysis Consulting - Consultants

LS-DYNA Consulting FEA Consultants

Australia	<u>Leading Engineering Analysis Providers, LEAP</u> Contact: info@leapaust.com
China	<u>Ove Arup & Partners</u> Contact: stephen.zhao@arup.com
China	<u>ETA China</u> Contact: lma@eta.com.cn
China	Shanghai Hengstar Technology Corp. http://www.hengstar.com
INDIA	<u>nHance Engineering Solutions Pvt Ltd</u> Contact: lavendra.singh@arup.com
INDIA	<u>EASi Engineering</u> Contact: rvenkate@easi.com
JAPAN	<u>JSOL Corporation</u> Contact: cae-info@sci.jsol.co.jp
JAPAN	<u>Itochu Techo-Solutions Corp.</u> Contact: ls-dyna@ctc-g.co.jp
JAPAN	<u>LANCEMORE</u> Contact: info@lancemore.jp
KOREA	<u>THEME Engineering</u> Contact: wschung@kornet.net
KOREA	<u>KOREAN SIMULATION TECHNOLOGIES</u> Contact: young@kostech.co.kr



LS-DYNA Distributors
LS-DYNA is delivered with
LS-OPT - LS-PrePost
LSTC Dummy & Barrier Models

Alpha Order by Country

Australia	Leading Eng. Analysis Providers - LEAP http://www.leapaust.com.au/ info@leapaust.com.au
Canada	Metal Forming Analysis Corp - MFAC http://www.mfac.com/ galb@mfac.com
China	ETA China http://www.eta.com.cn/ lma@eta.com.cn
China	OASYS Ltd. (software house of Arup) http://www.oasys-software.com/dyna/en stephen.zhao@arup.com
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Sweden	Engineering Research AB http://www.erab.se/ sales@erab.se
Taiwan	Flotrend Corporation http://www.flotrend.com.tw/ gary@flotrend.tw
Russia	State Unitary Enterprise –STRELA info@ls-dynarussia.com



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USA	Engineering Tech. Assc. Inc. – ETA http://www.eta.com/ sales@eta.com
USA	DYNAMAX http://www.dynamax-inc.com/ sales@dynamax-inc.com



LSTC Mailing List For Models News



The LSTC Models Development Team has decided to formalize the procedure of distributing news about LSTC's models in order to handle the increased number of recipients.

Previously, you have received news about LSTC's models, via direct e-mails from Sarba Guha. The previous mailing list was retired, as of the first invitation to the new mailing list.

If you are interested in receiving the LSTC Models News:

1. **Subscribe** to this new mailing list at the following website:

http://listserv.lstc.com/mailman/listinfo/lstc_models_news

2. **Receive:** You will receive an e-mail from the mail program with the following sender address:
[lstc_models_news-request@listserve.lstc.com]
with the subject line
"confirm" and an alpha-numerical code.

3. **Confirm:** Per the instructions in that e-mail, please confirm your e-mail address

4. **Address Book:** To ensure receipt of emails from LSTC Models News, add
[lstc_models_news@listserv.lstc.com]
to your address book or safe list

5. **Confidentiality:** Your e-mail address will not be distributed outside of LSTC and only used for the LSTC Models News.

Thank you for your interest in our products!

Best regards, LSTC Models Development Team



News Release

SGI

SGI Announces Fifth-Generation Altix ICE High Performance Compute Solution

Exceptional Compute/Performance Density System Based on FDR InfiniBand and the Latest Intel® Xeon® Processor Series

FREMONT, Calif. and HAMBURG, Germany, ISC 2011 — June 21, 2011 — SGI (NASDAQ: SGI), a trusted leader in technical computing, today announced the latest generation of SGI® Altix® ICE, a highly flexible, tightly integrated blade architecture based on the latest Intel® Xeon® (codenamed "Sandy Bridge EP") processor series. This newest Altix ICE solution represents the fifth generation of the award-winning high performance computing (HPC) solution, offering numerous advancements in performance and density while addressing the ongoing need to consolidate computing "cluster sprawl."

This next generation Altix ICE, with support for FDR InfiniBand, improves upon SGI's robustly designed, integrated blade system and continues the heritage of a purposefully designed scale-out technical computing solution. Generation over generation, the system design has become increasingly more flexible, enabling a broader range of options for compute nodes, topology types, InfiniBand™ fabric design, power, and cooling. The system is expected to scale to 2,304 cores in a single rack and boast several features, including:

New "building-block" blade enclosure design that offers an increase over the

standard 16 to 18 blade slots and 36 compute nodes per enclosure;
Intel® Xeon® (codenamed "Sandy Bridge EP") processor series-based two-socket node blades optimized for memory footprint and power;
Separable, upgradeable and independently scalable power shelves;
Choice of air cooling, bolt-on water cooling at the rack level, or optional liquid cooling at the compute node level;
Industry standard 19-inch width SGI D-Rack and a custom rack design for high density closed loop deployment, enabling multiple data center environment support.

"Over the years, SGI Altix ICE has enabled users in numerous fields to make significant advancements," said SGI CTO Dr. Eng Lim Goh. "This next generation design of Altix ICE starts at an affordable 10 teraflops, suitable for high performance computing for the masses or small- and medium-sized companies. From there, it seamlessly scales to more than 100 petaflops, making this the architecture leading to our exascale computing solution."

"Customers in the HPC industry need outstanding performance in a high density form factor with excellent power efficiency," said Rajeeb Hazra, general

manager of High Performance Computing at Intel. "By using Intel® Xeon® processors (codenamed "Sandy Bridge EP"), customers with data-intensive problems will get the newest generation of Intel and SGI's high performance computing technology, paving the way for customers to improve the resolution of their models, and deliver more meaningful scientific and technical results."

Designed to industry standard widths at the enclosure level, this latest generation of Altix ICE integrates seamlessly into multiple data center floor plan designs, including those with traditional hot/cold aisle configurations, high density closed loop cooling and large scale container deployments. The newest version of Altix ICE is expected to ship in time with the next generation Intel® Xeon® (codenamed "Sandy Bridge EP") processor series.

About SGI

SGI, a trusted leader in technical computing, is focused on helping

customers solve their most demanding business and technology challenges. Visit www.sgi.com for more information.

Connect with SGI on Twitter (@sgi_corp), YouTube (youtube.com/sgicorp), and LinkedIn.

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News Release

Panasas

Panasas Introduces ActiveStor 11, Delivering Cost-Effective Parallel Storage for High Performance Computing and Big Data Workloads

ActiveStor™ 11 Accelerates Time-To-Results for Mission Critical Research and Analysis; Ideal for HPC Private Cloud Deployments

SUNNYVALE, Calif. and Int'l Supercomputing Conference in Hamburg, Germany, June 20, 2011 – Panasas, Inc., the leader in high performance parallel storage for technical computing applications and big data workloads, today announced the Panasas ActiveStor 11 parallel storage system appliance. Powered by the PanFS™ operating system, ActiveStor 11 seamlessly scales to 6PB of capacity and 115GB/s of throughput from a single global namespace. Its advanced blade architecture blends performance, capacity, and cost-efficiency in a system optimized for data-intensive applications where time-to-results is a critical concern.

"Our customers know that Panasas represents the ultimate in performance, capacity and usability for computationally intensive application environments," said Faye Pairman, president and chief executive officer of Panasas. "ActiveStor 11 is an attractive solution to deliver a new level of cost effectiveness for a variety of markets, whether deployed as part of a dedicated research cluster or a multi-tenant private cloud platform."

The Panasas parallel scale-out storage architecture eliminates bottlenecks seen in traditional NAS systems, enabling HPC cluster nodes to directly access a single, scalable file system. Administrators can easily add new storage to the global namespace from a single point of management in fewer than 10 minutes without disrupting workflows. ActiveStor 11 features user quotas, snapshots, and per-user chargeback reporting so administrators can easily monitor and manage storage resources within their private cloud.

"As private clouds become more pervasive, it is clear that increasing numbers of HPC users will require highly scalable parallel storage systems that are dependable, easy to manage, and deliver the high throughput required for a wide range of technical computing applications," said Earl Joseph, IDC program vice president for high performance computing. "The Panasas ActiveStor 11 appliance is well positioned to capitalize on this important high performance computing trend."

Panasas is taking orders for ActiveStor 11 and expects to start shipping in August 2011. In addition, a 60TB

configuration of the existing ActiveStor 12 appliance is also expected to be available in the same timeframe. Accompanying the new product introductions is an across-the-board price reduction on all ActiveStor models. For more information, visit www.panasas.com, call (888) PANASAS or email info@panasas.com.

About Panasas

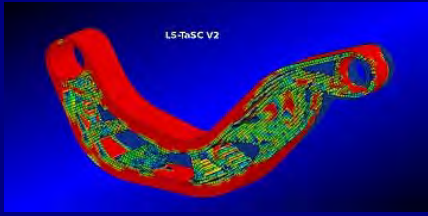
Panasas, Inc., the leader in high-performance parallel storage for technical computing applications and big data workloads, enables customers to rapidly solve complex computing problems, speed innovation and accelerate new product introduction. All Panasas storage products leverage the patented PanFS™ storage operating system to deliver superior performance,

data protection, scalability and manageability. Panasas systems are optimized for demanding storage environments in the bioscience, energy, finance, government, manufacturing, and university markets. For more information, visit www.panasas.com.

###

Panasas Media Contact
James McIntyre
McClenahan Bruer Communications
panasas@mcbbru.com
www.mcbbru.com
(503)546-1000

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Archive April 2011

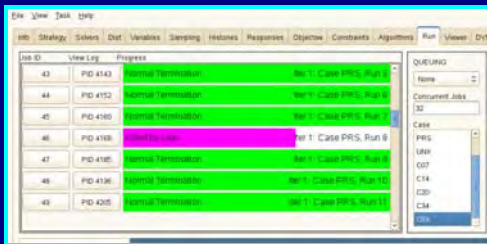
LS-TaSC™ Version 2 - Topology Design using LS-DYNA®

LS-Dyna - Topology And Shape Computation - LS-TaSC

The second version of LS-TaSC has been released by Livermore Software Technology Corporation.

LS-TaSC is a tool for the topology optimization of non-linear problems

involving dynamic loads and contact conditions. It can be used to find a concept design for most structures analyzed using LS-DYNA.



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Release of LS-OPT® Version 4.2

Livermore Software Technology Corporation is pleased to announce the release of LS-OPT® Version 4.2.

A major focus of the V4.2 development has been to refine and enhance the LS-

DYNA® job distribution features for running LS-OPT on a PC or Linux machine controlling and monitoring LS-DYNA jobs distributed on a Linux cluster.