

FEA Information News Bulletin Issue 1, October 2000

- Welcome to our first issue. Our goal is to be an e-mail news bulletin for the LS-DYNA global community and those products of our commercial participants that bundle or interface with LS-DYNA. We have chosen a Power Point Presentation format for easy reading. Send your suggestions to Marsha: mv@feainformation.com. If you would like a person added to our monthly mailing list please send me their e-mail address.
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LSTC - LS-DYNA
www.ls-dyna.com

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Future Goals

By: **Dr. John O. Hallquist**

- LSTC's goal is to combine multi-physics capabilities: solids, fluids, and heat transfer, within a single code environment for solving highly nonlinear problems. These capabilities are implemented in two and three dimensions and employ both explicit and implicit solvers. The single code environment enables the solution of multi-physics problems in one run rather than loosely coupling a multitude of independent codes in multiple runs.
- For manufacturing applications the single code environment should handle major processes such as: stamping, hydroforming, forging, casting, injection molding, and metal cutting.
- There is a growing demand for the MPI Implementation of LS-DYNA. MPP machines are replacing vector supercomputers at many of our customer's sites. MPP machines offer the fastest turnaround times. Most large jobs will finish in the same day on 8-16 processors.
- Under MPI, LS-DYNA supports both network computing and MPP machines running Unix and Linux operating systems. MPP/LS-DYNA 940.2b is used in production at many major companies throughout the world. Over one year ago DaimlerChrysler became the first U.S. auto company to adopt the MPP version in full production. LS-DYNA version 960 is now being ported and MPP/SMP versions will be released together starting with 960. This will be the first time that these versions will be released together.
- To be featured in an upcoming issue: Preview of 960 Features in LS-DYNA

Website Summary

By: Marsha Victory

During the month of September we added:

Heat Transfer Analysis: <http://www.heattransferanalysis.com>

Warhead Analysis: <http://www.warheadanalysis.com>

AVI files for shape charges AVI #62-64, 67
on Warhead Analysis and LS-DYNA sites

- (62) 3D Axisymmetric Shape Charge
- (63) Linear Shape Charge
- (64) "Standard" 81mm BRL shape charge
- (67) Shallow Shape Charge

AVI files for heat transfer #70 – 71, on heat transfer analysis site

- (70) Extrusion
- (71) Forging

AVI File for airbag deployment #24 on LS-DYNA site

Manuals in PDF format

- LS-DYNA Keyword Users Manuals
- LS-DYNA Structured Manual
- LS-DYNA Theory Manual
- LS-DYNA Examples Manual

**I am proud to announce I am working on my next website
scheduled to be completed in November - it is in rough draft
but if you want to take a look it will be Massively Parallel Computers -
www.massivelyparallelcomputers.com**

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Optimization

By Dr. Nielen Stander

- Optimization: LS-OPT allows the user to structure the design process, explore the design space and compute optimal designs according to specified constraints and objectives. The program is also highly suited to the solution of system identification problems.

The graphical tool LS-OPTui interfaces with LS-DYNA and provides an environment to specify optimization input, monitor and control parallel simulations and post-process optimization data as well as viewing multiple designs using LS-POST

LS-OPT and LS-OPTui Version 1c is available on LSTC's <ftp.lstc.com> site. This version is accompanied by LS-OPTui, a graphical user interface that allows LS-OPT input specification, LS-DYNA job monitoring and LS-OPT post-processing. The interface has the following features:

- Provides a comprehensive LS-DYNA interface to access quantities from the binary or ASCII database. Functions such as minimum/maximum over time, averaging, and filtering can be requested.
- Provides specification of the optimization problem formulation using the available LS-OPT features.
- Provides monitoring of LS-DYNA run progress for jobs running in parallel. Pausing, resuming, stopping and restarting of LS-DYNA runs can be controlled.

LS-OPTui post-processing includes accuracy assessment of response surfaces, optimization history of the successive approximation method, and interactive trade-off using response surfaces.

For details, please consult the latest "ReleaseNotes" at the ftp site or e-mail LSTC at sales@lstc.com.

- For comprehensive optimization information visit:
<http://www.crashoptimization.com>

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Excerpt from Sept. 2000
CAD-FEM GmbH Press Release
For the full version of the press release
contact Alexander Kunz: akunz@cadfem.de

- Record attendance for the 18th CAD-FEM USERS' MEETING – INTERNATIONAL CONGRESS ON FEM TECHNOLOGY.

Users flood to Lake Constance: The largest annual CAE meeting in Germany set sail in Sept. at Friedrichshafen on Lake Constance. On board: over 550 attendees from industry and research, 180 technical presentations and 40 hardware and software exhibitors. CAD-FEM GmbH organized this 18th annual swift and sure voyage and joined their guests to set a new course record for International FEM Technology.

- **Mass and Class:** One does not have to exclude the other. With 556 guests attending their meetings, CAD-FEM GmbH above all owes the precipitous rise of the number of participants from 381 (1999) to their loyal user's group which waived the flag.. This eighteenth meeting, held from Sept. 20– 22 at the Kultur- und Congress-Centrum Graf-Zeppelin-Haus“ in Friedrichshafen, was characterized by featured keynote lectures from numerous technical experts – from soundful names including Professor Maier (ETH Zurich), Dr. Schelkle (Dr. Ing. h.c.F. Porsche AG), and Mr. Maichl (FESTO AG), Dr. Hallquist (LSTC), Professor Ramm (University of Stuttgart) and Professor Kikuchi (University of Michigan).
- The master program of the conference was a cruise on Lake Constance aboard the “MS Schwaben”. Steeped not only in culinary tradition, the attendees were also acoustically spoiled by Ingeborg Schöpf, Soprano at the State Operetta House of Dresden. Our special thanks to our main sponsors Hewlett Packard GmbH and Silicon Graphics GmbH for their generous contributions to make this a memorable voyage.
- The documentation presented at the 18th CAD-FEM USERS' MEETING – INTERNATIONAL CONGRESS ON FEM TECHNOLOGY, can be ordered directly from CAD-FEM. Contact: CAD-FEM GmbH, Marktplatz 2, 85567 Grafing, Germany. Telephone: +49 (0) 80 92-7005-0, Fax: +49 (0) 80 92-7005 - 77, E-mail: marketing@cadfem.de, Internet: <http://www.cadfem.de>

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A Recommended Resource Site
By: Trent Eggleston

This month we focus on a resource site of informational links. The site is owned and operated by Richard Maloney.

<http://www.eaglequest.com/~richard/links.html>

Among the many links are those of interest for engineers in the automotive industry:

- Automotive Crash Testing
- Automotive Safety Regulations
- Automotive Engineering Analysis
- Automotive Engineering Design
- Automotive Media

Richard Maloney is an engineer in the Detroit, USA office of Ove Arup & Partners, where he does computer simulations of vehicle crashes for the automotive industry.

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Recommended Papers By: Denette Trowbridge

The following papers were showcased in September. If you would like a copy please feel free to e-mail me at: dt@feainformation.com

- Publication #C2-2
 - *Accurate and Detailed LS-DYNA FE Models of the US- and Eurosid: A review of the German FAT Project* - Ulrich Franz, Oliver Graf (CADFEM); Andreas Hirth, Matthias Walz (DaimlerChrysler, AG)
- Publication #9-3
 - *Analysis of a Propane Tank Truck Impacting a Concrete Column Using LS-DYNA* - Clayton F. Heberling (Pressure Science, Inc.)
- Publication #10-4
 - *Piercing of Aluminum Beverage Cans* - Brian A. Coon (Phanidhar Anugonda), John Reid (University of Nebraska-Lincoln)
- Publication #10-1
 - *A Comparison between Experimental Testing and Numerical Simulations of Impact Loading on Aluminum and Magnesium Steering Wheel Armatures* - William Altenhof (U. of Windsor) and William Ames (KS Centoco, Ltd.)
- Publication #4-1
 - *Polyurethane Material Models for Simulating Leg-Form Impact in Explicit Transient Dynamics* - Joe Hassan (DaimlerChrysler), Peter Schuster, G. Frederick (Ford Motor Co.)

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Websites & Commercial Participants

| WEBSITE: | URL: |
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| FEA Information | www.feainformation.com |
| Crash-Analysis | www.crash-analysis.com |
| Mesh Generating | www.meshgenerating.com |
| Warhead Analysis | www.warheadanalysis.com |
| Heat Transfer Analysis | www.heattransferanalysis.com |
| Crash Optimization | www.crashoptimization.com |
| Linux for PC | www.linuxforpc.com |
| Linux for Servers | www.linuxforservers.com |
| FEA Publications | www.feapublications.com |
| Drop Testing | www.droptesting.com |
| Metal Forming Simulation | www.metalformingsimulation.com |
| Computational Fluid Dynamics | www.computationalfluidynamics.com |

FEA Information's Commercial Participants:

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|---|------------------------|
| Livermore Software Technology (USA) | OASYS, Ltd., (UK) |
| CAD-FEM GmbH (Germany) | ANSYS, Inc. (USA) |
| Engineering Technology Associates (USA) | Hewlett Packard (USA) |
| Japanese Research Institute (Japan) | EASi Engineering (USA) |

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