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INTELLIGENT LIGHT
FieldView 12.1
Large-Scale
CFD Post-Processing

LS-PrePost®
New Features

NEC's SX-9 Supercomputer Achieves the World's Fastest Speed on the HPC Challenge Benchmark

FEA Information Announcements:

New Participants:

EASi – India

EngineSoft - Italy

Update to our PrePost software page:

Intelligent Light - FieldView

Sincerely,

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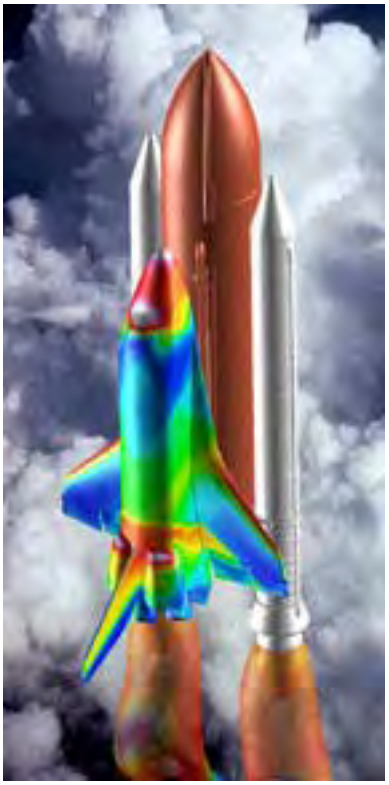
Large-Scale CFD Post-Processing Gains Significantly Faster Parallel Performance, New Advanced Visualization Tools with Intelligent Light's FieldView 12.1 Release

www.ilight.com/fieldview12.1release.php



FieldView 12.1 excels with large data. Image shows 80M cell space shuttle simulation results using background image feature and lighting controls available in FieldView version 12.1. Simulation data courtesy of NASA Johnson Space Center.

FieldView version 12.1 is the fastest version of FieldView ever delivered bringing substantial post-processing performance improvements for multi-core workstations and parallel servers. The performance is complimented by major additions to the renowned FieldView presentation capabilities. The latest release of FieldView brings many new tools to help CFD practitioners improve their capability, productivity, and impact.

"FieldView version 12.1 delivers entirely new levels of parallel performance and allows more information to be clearly communicated using the newly added features for controlling lighting, rendering, and color composition for maximum visual impact," said FieldView product manager Matthew N. Godo, Ph.D. "We've been working with our customers and partners for several years to bring tools to users that address the emerging challenges of large volumes of data for complex and often transient simulations and to recognize the need to improve productivity when extracting insight when delivering results to their constituents. FieldView 12.1 is already being embraced by our customers for the parallel performance productivity gains and the ease with which the functionality fits into existing workflows."

The high-performance parallel capabilities of FieldView 12.1 mean drastic reductions in the time required to read-in parallel data and run simulations. According to Steve M. Legensky, Intelligent Light general manager, "The large-data performance advancements in FieldView 12.1 are tremendous. In one case, the improvements in this release reduced what had been a four-hour task to under 15 seconds on the same hardware. That kind of performance will clearly help our customers improve productivity and increase the return on their investment in CFD post-processing with FieldView."

Speed, performance benefit large-data users

Customers around the world and across industries are already putting FieldView 12.1 to the test. In Europe, one aerospace customer reports routinely handling 50 million element models on multi-core laptops running 64-bit Windows® systems. Two of Intelligent Light's Formula 1 team customers are using FieldView 12.1 to solve problems that exceed 120 million tetrahedal elements on deskside and laptop workstations running 64-bit Windows® and Unix operating systems.

The world's largest aerospace and defense contractors rely on FieldView for productivity, workflow automation, and accuracy as they develop next-generation workflows based on multiple solver engines, multi-physics data, and distributed HPC resources. Global automotive companies, including Japan's largest automaker, have developed their engineering capabilities using FieldView as a standard CFD post-processing tool.
"Major improvements in parallel scaling are seen with this release for solutions based on both tetrahedral and arbitrary polyhedral meshes," says Dr. Godo. "Our collaboration with our solver partners has produced high-quality data exchange capabilities that take full advantage of the parallel improvements introduced with FieldView 12.1. Our customers' ability to ask and answer complex questions, even as they are working to reduce their turnaround times, has improved significantly."

One such partner, ACUSIM Software, maker of the general-purpose, finite element-based CFD flow solver AcuSolve™, hails the benefits of FieldView 12.1.
"The AcuSolve new direct reader in FieldView provides our users with an easy and efficient method to access and visualize key AcuSolve results, supporting vital features from our most recent release," says Dr. Farkin Shakib, ACUSIM founder and president. "The combination of AcuSolve and FieldView provides an excellent solution environment for today's complex fluids only and multiphysics simulations."

New visualization features provide further enhancement

All FieldView 12.1 users will benefit from new image quality and control features that augment the application's renowned visual presentation capabilities. Image quality tools include advanced lighting controls, anti-aliasing, and the ability to incorporate background images containing pictures and logos. Another new tool, multiple color mapping, will enable engineers to visually draw distinctions between different variables in a single image or animation - illustrating multiple physical properties, such as shock vs. axial-flow, or model elements, such as temperature of wall vs. flow domain.
"These new image control features build on FieldView's traditional strength of superior presentation capabilities," Dr. Godo says. "Clearly and effectively communicating complex simulation results in order to deliver answers and insights quickly requires powerful, yet easy to use, visualization tools, and FieldView 12.1 provides the best in the industry."

New release brings similar improvements to new platforms

The new release for Apple MAC OS (version 10.5) delivers high performance with a native MAC / Intel FieldView port. "FieldView and MAC make life easy and productive for the SimCenter team. FieldView is used to support our roles as CFD practitioners and developers of both software and methods, and the 12.1 release has performed solidly on both MAC systems and our LINUX servers,"

said Steve Karman, research professor, Ph.D., UT SimCenter at Chattanooga.

FieldView 12.1 will be the first release to include a 64-bit FieldView server for Windows HPC Server family of operating systems from Microsoft. Microsoft and Intelligent Light are working together to insure that HPC clusters running Windows HPC Server get the best possible performance from their hardware investment.

About Intelligent Light

Intelligent Light, located in Rutherford, New Jersey, was founded in 1984 with a mission to provide the scientific and engineering community with the best possible tools for understanding data and communicating results. The company provides CFD post-processing and big data visualization capability, under the industry leading FieldView brand and through its Applied Research Group, to thousands of HPC users in the aerospace, automotive and general manufacturing industries. Their unique development team is composed of CFD leaders, computer scientists, and visualization experts focused on listening to clients and delivering products that meet their needs.

Powered By Silicon Graphics, Pleiades Supercomputer Fuels NASA's Journey to Moon, Then Mars - Press Release

www.sgi.com/company_info/newsroom/press_releases/2008/november/nasa_pleiades.html

Ranked No. 3 in the World, New SGI Altix ICE System Lets Researchers Attack Problems Without Compromises

NASA's newest supercomputer at Ames Research Center, Moffett Field, Calif., has garnered the number three spot on the Top500 list of the world's most powerful computers.

AUSTIN, Texas, Supercomputing 2008, Booth 1009 (November 17, 2008) — With its sights set on colonizing the moon and eventually sending astronauts to Mars, NASA is calling on researchers to solve some of the most complex science and engineering problems in history.

Key to that effort is Pleiades, the world's third fastest supercomputer, installed at the NASA Advanced Supercomputing facility at NASA Ames Research Center in Mountain View, Calif. The 51,200-core SGI® Altix® ICE 8200EX system from Silicon Graphics, Inc. (SGI) (NASDAQ: SGIC) is capable of generating a theoretical peak of 609 trillion operations per second (TeraFLOPS).

Today, Pleiades made its debut on the Top500 list (www.top500.org) with demonstrated performance of 487 TeraFLOPS on the LINPACK benchmark. The results make Pleiades the world's most powerful general-purpose supercomputer.

Pleiades offers researchers unprecedented resources for a range of projects in support of all of NASA's mission directorates, though most of the work, at least initially, is expected to support the development of NASA's next-generation space fleet. Known as Project Constellation, the manned space exploration effort will involve years of sophisticated, high-fidelity scientific and engineering studies, from virtually testing re-entry vehicle options to designing safety systems.

Researchers will even use Pleiades to simulate catastrophic failures — specifically so they can design systems and procedures to prevent problems that might threaten the safety and survival of astronauts.

Pleiades supplements Columbia, the 14,336-core SGI® Altix® system that debuted in 2004 as the world's second-fastest computer. Columbia helped NASA successfully resume its Space Shuttle program while saving millions of hours of research time on many other projects.

"With Pleiades, we can do six times the work that we could on Columbia," said Rupak Biswas, acting chief of the NASA Advanced Supercomputing (NAS) Division. "Now our researchers are making their projects as large and complex as they need, without having to compromise simulation completeness or fidelity to make room or time for other

projects. We're already seeing real productivity benefits that will help keep Project Constellation and other NASA research initiatives on schedule."

"For 50 years, no one has looked farther or reached further than NASA," said Silicon Graphics CEO Robert "Bo" Ewald. "We were proud to count NASA as our very first customer more than a quarter century ago, and we are just as proud today to supply the agency with Pleiades — the supercomputer that will help usher in the next great age of space exploration."

"To witness the state of the art in supercomputing, organizations need look no further than Pleiades," said Richard Dracott, General Manager of High Performance Computing at Intel. "This powerful system leverages the scalability and energy efficiency of Intel® Xeon® processors and the rapidly deployable, high-productivity SGI Altix ICE platform. Intel congratulates NASA and Silicon Graphics for once again making history with a supercomputer that not only will help shape our future here on Earth, but will fuel our exploration of new worlds that await our discovery."

Additional Information:

Pleiades has more than doubled in power and capacity since this summer, when Silicon Graphics and NASA installed the system's initial 40 SGI® Altix® ICE racks. The rapid expansion resulted from a joint effort by NASA, Silicon Graphics and Benchmark Electronics.

Today, 100 SGI Altix ICE racks have been installed, giving researchers access to 12,800 Quad-Core Intel® Xeon® 5300 Series processors, 50 Terabytes (TB) of memory, 900TB of SGI® InfiniteStorage 15000 InfiniBand RAID arrays, and a 115TB SGI® InfiniteStorage NEXIS NAS solution. Pleiades runs SUSE Linux Enterprise Server.

In producing Pleiades, Silicon Graphics partnered with Mellanox Technologies to create the world's largest InfiniBand (IB) cluster with more than 12,800 end-point nodes[1], connected via more than 20 miles of double data rate IB cables. The Pleiades system's IB interconnect is more than 70 percent larger than the next two largest systems combined[2]. In total, it supports over 128TBits/second of simultaneous, nearest-neighbor IB communications bandwidth.

Pleiades is Silicon Graphics' largest deployed SGI Altix ICE system —3.5 times larger than any other SGI Altix ICE installation. It comprises a total of 6,400 dual-socket computational blades, which were developed, produced and deployed in partnership with SuperMicro Computer, Inc.

Earlier this month, NASA achieved rapid productive deployment when it turned the bulk of Pleiades (32,000 cores) over to users for full-time, productive research. This followed months of rigorous testing, during which NASA maintained multiple environments so researchers could use between 4,096 and 14,000 cores for production work, while administrators tested the Lustre filesystem, the InfiniBand interconnect fabric, and other components.

In addition to Constellation Program projects, NASA is using Pleiades to model the evolution of galaxies, refine visualization methods for the V-22 Osprey Tiltrotor aircraft, and conduct complex calculations to determine how life first originated on Earth.

Silicon Graphics, Inc.

Silicon Graphics, Inc. (SGI) (NASDAQ: SGIC), is a leader in high-performance computing. SGI delivers a complete

range of high-performance server and storage solutions along with industry-leading professional services and support that enable its customers to overcome the challenges of complex data-intensive workflows and accelerate breakthrough discoveries, innovation and information transformation. SGI solutions help customers solve their computing challenges whether it's enhancing the quality of life through drug research, designing and manufacturing safer and more efficient cars and airplanes, studying global climate, providing technologies for homeland security and defense, or helping enterprises manage large data. With offices worldwide, the company is headquartered in Sunnyvale, California, and can be found on the Web at www.sgi.com.

Note: SGI corporate phone numbers have changed. The new main number for SGI corporate headquarters is 408-524-1980. Effective immediately, all numbers featuring the 650 area code are no longer in service.

Editor's Note

[1] Dual-plane interconnect results in two IB end-points per compute blade plus storage nodes

[2] The Pleiades IB interconnect is 70 percent larger than those utilized by Los Alamos National Laboratory Roadrunner and the Texas Advanced Computing Center

Visual-Crash for LS-DYNA®

Visual-Crash for LS-DYNA pdf Power Point

Visual-Crash for DYNA is the most competitive environment solution for LS-DYNA solver. It 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 as it addresses the coupling with tier Finite Element or Rigid Body simulation software. Leveraging this state of the art environment, Visual Viewer, visualization and plotting solution, helps analyze LS-DYNA results within a single user interface. Visual Viewer performs automated tasks and generates customized reports therefore increasing engineers productivity.

Key Features

- Support of LS-DYNA 971 and previous versions
- Model Assembler
- Intersection and Penetration check
- Advanced Part Replace
- Coupling with MADYMO Dummy Positioning and Auto Seat Belt Creation
- Entity Visualization
- Global Find and Replace
- Time Savers

Benefits

- One complete solution for Crash and Safety Applications
- Handles large data models
- Native Windows
- Fast iteration and rapid model revision process
- Process Compliant GUI
- All functionalities generate session
- Dialogs and Database are accessible for scripting which enables quick customization

NEC's SX-9 Supercomputer at Tohoku University Achieves the World's Fastest Speed on the HPC Challenge Benchmark

http://www.nec.co.jp/press/en/0811/1201.html

Tokyo, November 12, 2008 - NEC Corporation's SX-9 supercomputer, which began operation at Tohoku University's Cyber Science Center (Sendai City, Miyagi prefecture, Japan; Hiroaki Kobayashi, Director) in March 2008, has achieved the world's fastest standing in the High Performance Computing (HPC) field through scoring top marks on 19 of 28 areas in the HPC Challenge Benchmark test.

The HPC Challenge Benchmark, financed by the U.S. government, was created by a team of HPC authorities led by Dr. Jack Dongarra of the University of Tennessee. The HPC Benchmark complements the Linpack Benchmark, which is used to rank the performance of the world's top 500 supercomputers, and was established in order to measure the performance of supercomputers from a diverse range of viewpoints.

The HPC Challenge Benchmark evaluates computing performance from 28 different comprehensive areas, which includes 7 categories, the Linpack Benchmark, and fundamental factors on memory, networks and application software.

The results released today reflect testing carried out by HPC Challenge Benchmark programs on NEC's SX-9 supercomputer. Among the 28 areas evaluated, the SX-9 recorded world leading marks in the following: 8 areas of memory bandwidth (STREAM) both for a single CPU and in a parallel environment; 5 areas of inter-process data transfer rate (Bandwidth); 2 areas of processing performance in matrix-matrix multiply (DGEMM), 2 areas of FFT and 2 areas for random memory access for a single CPU and a parallel environment.

Looking forward, NEC will continue its drive to provide world leading supercomputers that secure top placement in the HPC Challenge Benchmark.

SX-9 HPC Challenge Benchmark Results
www.nec.co.jp/press/en/0811/1201-01.html

About NEC Corporation:
NEC Corporation is one of the world's leading providers of Internet, broadband network and enterprise business solutions dedicated to meeting the specialized needs of a diversified global base of customers. NEC delivers tailored solutions in the key fields of computer, networking and electron devices, by integrating its technical strengths in IT and Networks, and by providing advanced semiconductor solutions through NEC Electronics Corporation. The NEC Group employs more than 150,000 people worldwide. For additional information, please visit the NEC website at: http://www.nec.com

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D3 VIEW - Tracking Developments in LS-DYNA

http://blog.d3view.com/

d3VIEW is a web-based tool that extracts information from LS-DYNA generated "d3hsp" files and presents it in a concise, user-friendly format.

Background

The tool was developed as a hobby project by Suri Bala to ease the review of user provided input and result files in a concise and efficient manner. Suri Bala works full-time at Livermore Software Technology Corporation.

Featured in the Archive for the 'LS-DYNA Bytes' Category

Multi Solver Run in LS-OPT
Published by Suri Bala November 11th, 2008

In LS-OPT, one can run a multi-disciplinary optimiztion or a multi-solver type optimization problem, where the variables can be shared among the different solvers. In performing DOE or any optimization using LS-OPT, it is important that consistent experimental points are used in the evaluations. To ensure this, one can use solver experiment duplicate solver_1 [...]

Packing LS-DYNA Input Files for Easy Distribution (v1.1a)
Published by Suri Bala October 15th, 2008

In a previous post about a simple Python script that scans a LS-DYNA input file to package all INCLUDED files recursively so the entire model can be compressed and sent to the recipient.

Based on some new suggestions, largely by Brian Wainscott, I have attached a revised script that handles the included files [...]

Damage modeling using GURSON
Published by Suri Bala October 13th, 2008

Material parameter identification of GURSON material requires a process of fitting using an optimization package such as LS-OPT to match against a measured response such as a test. Following is a stress-strain curve that is achieved as a process of parameter identification using LS-OPT and LS-DYNA.

Characterizing plasticity material models using data from test
Published by Suri Bala October 9th, 2008

It is common to perform a uni-axial tensile test on a material sample to generate stress-strain curve for use in numerical models in LS-DYNA. The problem frequently encountered by analysts is the cleaning of the test data that is usually noisy. I recently wrote a small Python utility that takes any test generated force-deflection curve [...]

Optimizing monotonically increasing load curves
Published by Suri Bala October 9th, 2008

In cases where a monotonically increasing curve such as pressure_vs_leakage in *AIRBAG or effective_stress_vs_effective_strain in plasticity models in *MAT are to be parametrically identified by an optimization software such as LS-OPT to match against a physical test, it is important to ensure that the points identified by LS-OPT satisfy the non-negative slope. To satisfy this, [...]

LS-PrePost® Update

http://www.lstc.com/lspp

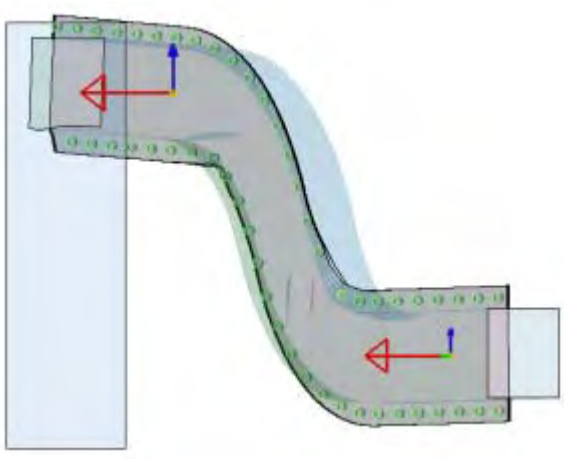
New LS-PrePost Feature #1

When plotting *secforc* data (using the ASCII interface) with *d3plots* loaded, section force vectors can be displayed on the model. The general procedure is as follows:

1. Load a set of d3plots
2. Load the corresponding secforc file using the Page 1: ASCII interface
3. Select the sections you wish to plot in the side panel
4. Activate “Plot Secforc Vector” in the bottom panel
5. Enter a vector size scale factor (“VsizeSF”)
6. Click the “Anim” render button
7. Play the animation (it may help to click the “Feat” render button)

New LS-PrePost Feature #2 When using the Trace interface with a Follow plane defined, relative *BOUNDARY_PRESCRIBED_MOTION curves can be written for nodal displacements. The general procedure is as follows:

1. Load a set of d3plots (File > Open > Binary Plot)
2. Define a “Follow Plane” based on 3 nodes using the Page 1: Follow interface
3. Go to the Page 1: Trace interface and select some nodes
4. Click “WrBPM” in the side panel to write boundary prescribed motion curves (relative to the follow plane) for the selected nodes



NOVEMBER 2008 LS-PrePost® Internet Update

21-Nov - Added support for multiple integration points per layer for *ELEMENT_SHELL

21-Nov - Added ability to display section force vectors on a model while plotting *SECFORC* data using the ASCII Interface (with *D3PLOT* files loaded)

21-Nov - Added ability to write relative *BOUNDARY_PRESCRIBED_MOTION curves using the Trace Interface while a Follow point/plane is set

21-Nov - Added support for reading PAM-CRASH input files

21-Nov - Added ability to display the following set types using Page D:
*SET_BEAM_ADD, *SET_DISCERET_ADD, *SET_NODE_ADD,
*SET_NODE_ADD_ADVANCED, *SET_PART_ADD, *SET_SOLID_ADD,
*SET_SEGMENT_ADD, and *SET_SHELL_ADD

21-Nov - Added support for some additional keywords:
*BOUNDARY_RADIATION_SEGMENT_VF_READ,
*BOUNDARY_RADIATION_SEGMENT_VF_CALCULATE,
*BOUNDARY_RADIATION_SET_VF_READ,
*BOUNDARY_RADIATION_SET_VF_CALCULATE,
*BOUNDARY_RADIATION_SET_EF_READ,
*BOUNDARY_RADIATION_SET_EF_CALCULATE, *LOAD_SEGMENT_SET_ANGLE,
*MAT_MCCORMICK (*MAT_167), amd *MAT_POLYMER (*MAT_168)

One Man's Corner

Henry H. Fong, Consultant, Texas, USA
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All Chapters are Now Posted On Line
www.feapublications.com

link: featured

Part 1.A Postbuckling Strength and Dynamic Response of Thin Shells

Part 1.B Evaluation of COSMIC/NASTRAN Program

Part 1.C Structural Analysis of Solar Energy Heliostats

Part 1.D Nonlinear FEA of Elastomeric Potting Materials in Traveling Wave Tubes

EASi Conducts First LS-DYNA Users Event in Bangalore

November 7, 2008 EASi held the LS-DYNA Users Event, bringing together engineers, consultants, professors, students, and many others from educational institutions and industry including Automotive, Aerospace, Heavy Equipment, Light Industrial, etc.

This afforded the Indian CAE community the right platform to learn more about cutting edge developments in LS-DYNA, available platforms. Additionally, as the LS-DYNA distributor many questions on network licensing, and other options were discussed to reduce cost and time to market.

Dr. Tushar Goel, Senior Scientist at Livermore Software Technology Corporation (LSTC) discussed the latest developments in the LS-DYNA software and various methods for optimum usage of LS-DYNA. He introduced LS-OPT, the latest optimization tool for LS-DYNA, and explained the different methods of optimization using LS-OPT. Using various case studies, Dr. Goel demonstrated the applications of LS-OPT to improve user productivity and achieve substantial cost reductions.

These developments will cultivate productivity improvements and will advance innovations across the LS-DYNA user base" said Ramesh Venkatesan, Head – Technology Support Group (TSG) at EASi.

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About EASi

Founded in 1981, EASi is a global engineering firm that services the US, UK, Germany, Japan and India markets. We are a trusted global engineering partner to our customers. We enable our customers to realize varied benefits of globalization using our global engineering expertise, best-in-class recruiting capabilities and knowledge management framework. For more information visit http://www.easi.com or send an email to info@easi.com.

# # #

ALYOTECH TECHNOLOGIES –
société du groupe ALYOTECH FRANCE

www.alyotech.fr

Training Classes

LS-DYNA applications to Protective Structures, Blasts, Vehicles (IED and mines), and Home Land Security

By : Dr. Ala TABIEI
Place : Paris
Date : 12th and 13th of Jan. 2009

Constitutive Models, Composites, and User Materials in LS-DYNA

By : Dr. Ala TABIEI
Place : Paris
Date : 14th to 16th of Jan. 2009

Crash & Impact

By : Paul DUBOIS
Place : Paris
Date : 17th to 20th of March 2009

Concrete & Geomaterial Modeling in LS-DYNA

By : Len SCHWER
Place : Paris
Date : 6th and 7th of Oct. 2009

Blast & Penetration Modeling in LS-DYNA

By : Len SCHWER and Paul DUBOIS
Place : Paris
Date : 8th and 9th of Oct. 2009

ALYOTECH Technologies

Contact for Information & Registration :
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Engineering Technology Associates (China), Inc.
39D, Shangshi Bldg, No.18 Caoxi Rd.(N.),Shanghai
Tel: 86-21-51875539 Fax: 86-21-64385752

Engineering Technology Associates (China) Inc. a leading LS-DYNA distributor headquartered in Shanghai, China held a seminar specifically for the application use of LS-DYNA in the Steel Industry.

The seminar conducted by ETA-China, was held at the University of Science & Technology Beijing) on Oct. 31, 2008. Approximately 30 attendees were present from the main steel manufacturers and steel research institutes in China. Among the industry leading companies attending the conference were Shou Steel, Anshan Steel, Taiyuan Steel and China Iron & Steel Research Institute, etc.

Attending this seminar, Prof. Kang Yonglin, Ph.D Zhu Guoming of USTB and Senior Specialist Mr. Li Jianpin of ETA-China introduced LS-DYNA applications in the Metal Forming field. Additionally showcased was the use of PrePost eta/DYNAFORM bundled with LS-DYNA for a Metal Forming Solution.

7th European LS-DYNA Conference

Uli Franz, DYNAmore

The 7th European LS-DYNA Conference, May 14-15, will provide an ideal forum for LS-DYNA users from all over the world to share and discuss experiences, to obtain information on upcoming features of LS-DYNA, and to learn more about new application areas. The conference will be accompanied by an exhibition area featuring the latest software and hardware developments related to LS-DYNA.

It will take place at "one of the most beautiful regions on earth", as Alexander von Humboldt described Salzburg. The Old Town of Salzburg is a splendid example of baroque architecture and awarded by UNESCO as world heritage. Salzburg is also known as the birthplace of the famous composer Wolfgang Amadeus Mozart. Some may know Salzburg as the scenery of the film "The Sound of Music".

The conference venue is located in the old town of Salzburg. Salzburg can be reached easily via freeway, the high speed train ICE, and the international airports of Salzburg or Munich.

The Conference will be organized by DYNAmore with assistance from LSTC, Alyotech, Arup, and ERAB. We kindly encourage all users to present their work with LS-DYNA or LS-OPT at the conference.

General information:

Included in the applications being covered are:

- Crash
- Occupant safety
- Metalforming
- Optimization
- Robustness
- Spotwelding, bonding
- Implicit
- Pedestrian safety
- Impact, drop test
- Plastics
- Composites
- Ballistics and penetration
- Fluid structure interaction, CFD
- CAE processes integration

Accompanying Classes May 11-13th
Classes will be on various applications such as crash, optimization, metalforming, occupant safety and others. Information will be provided soon.

Conference Paper Submission

Abstract Deadline:	January 12, 2009
Acceptance:	January 30, 2009
Final Paper:	April 03, 2009

Form to submit a paper:

Pre Post Processing Software

Livermore Software Technology Corporation

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

Engineering Technology Associates, Inc

FEMB Engineering Technology Associates' Finite Element Model Builder (FEMB) is a finite element pre- and post-processor for use with all major analysis codes and CAD Software.

Japanese Research Institute, Ltd

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

Intelligent Light

FieldView provides LS-DYNA users powerful post-processing to quickly identify important characteristics in large and complex data and and allows interactive exploration to develop a thorough understanding. Examine and compare cases, extract critical values, and make compelling presentations that make an impact.

Oasys, Ltd

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.

BETA CAE Systems S.A.

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. μETA, a thriving innovative software with special features for the high performance and effortless 3D & 2D post-processing of LS-DYNA results.

Simpleware

Provides software solutions for robust, fast, and easy conversion of 3D images into high quality meshes which can be used for FEA, CFD, CAD, RP.

Participant LS-DYNA® Resource Page (alpha order)

Fully QA'd by Livermore Software Technology Corporation

SMP and MPP Hardware and OS

FUJITSU

FUJITSU Prime Power	SUN OS 5.8
FUJITSU VPP	Unix_System_V

HP

HP PA-8X00	HP-UX 11.11. and above
HP IA-64	HP-UX 11.22 and above
HP Opteron	Linux CP4000/XC
HP Alpha	True 64

INTEL

INTEL IA32	Linux, Windows
INTEL IA64	Linux
INTEL Xeon EMT64	Linux, Windows 64

NEC

NEX SX6	Super-UX

SGI

SGI Mips	IRIX 6.5X
SGI IA64	SUSE 9 w/Propack 4 Red Hat w/ Propak 3

Participant LS-DYNA® Resource Page (alpha order)

Fully QA'd by Livermore Software Technology Corporation

MPP and Interconnect MPI

FUJITSU

	O/S	HPC Interconnect	MPI Software
FUJITSU Prime Power	SUN OS 5.8		
FUJITSU VPP	Unix_System_V		

HP

	O/S	HPC Interconnect	MPI Software
HP PA8000	HPUX		
HPIA64	HPUX		
HP Alpha	True 64		

INTEL

	O/S	HPC Interconnect	MPI Software
INTEL IA32	Linux, Windows	InfiniBand (Voltaire), MyriCom	LAM/MPI, MPICH, HP MPI, SCALI
INTEL IA64	Linux		LAM/MPI, MPICH, HP MPI
INTEL Xeon EMT 64	Linux	InfiniBand(Topspin, Voltaire), MyriCom, PathScale InfiniPath	LAM/NPI, MPICH, HP MPI, INTEL MPI, SCALI

NEC

	O/S	HPC Interconnect	MPI Software
NEX SX6	Super-UX		

SGI

SGI Mips	IRIX 6.5 X	NUMAlink	MPT
SGI IA 64	SUSE 9 w/Propack 4 RedHat w/Propack 3	Numalink, InfiniBand(Voltaire)	MPT, Intel MPI, MPICH

LS-DYNA® Resource Page - Participant Software

Interfacing or Embedding LS-DYNA - Each software program can interface to all, or a very specific and limited segment of the other software program. The following list are software programs interfacing to, or have the LS-DYNA solver embedded within their product. For complete information on the software products visit the corporate website.

ANSYS - ANSYS/LS-DYNA

ANSYS/LS-DYNA

Built upon the successful ANSYS interface, ANSYS/LS-DYNA is an integrated pre and postprocessor for the worlds most respected explicit dynamics solver, LS-DYNA. The combination makes it possible to solve combined explicit/implicit simulations in a very efficient manner, as well as perform extensive coupled simulations in Robust Design by using mature structural, thermal, electromagnetic and CFD technologies.

AI*Environment:

A high end pre and post processor for LS-DYNA, AI*Environment is a powerful tool for advanced modeling of complex structures found in automotive, aerospace, electronic and medical fields. Solid, Shell, Beam, Fluid and Electromagnetic meshing and mesh editing tools are included under a single interface, making AI*Environement highly capable, yet easy to use for advanced modeling needs.

ETA – DYNAFORM

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

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.

MSC.Software - MSC.Dytran LS-DYNA

Tightly-integrated solution that combines MSC.Dytran's advanced fluid-structure interaction capabilities with LS-DYNA's high-performance structural DMP within a common simulation environment. Innovative explicit nonlinear technology enables extreme, short-duration dynamic events to be simulated for a variety of industrial and commercial applications on UNIX, Linux, and Windows platforms.

MSC.Software - MSC.Nastran/SOL 700

The MSC.NastranTM Explicit Nonlinear product module (SOL 700) provides MSC.Nastran users the ability access the explicit nonlinear structural simulation capabilities of the MSC.Dytran LS-DYNA solver using the MSC.Nastran Bulk Data input format. This product module offers unprecedented capabilities to analyze a variety of problems involving short duration, highly dynamic events with severe geometric and material nonlinearities.

MSC.Nastran

Explicit Nonlinear will allow users to work within one common modeling environment using the same Bulk Data interface. NVH, linear, and nonlinear models can be used for explicit applications such as crash, crush, and drop test simulations. This reduces the time required to build additional models for another analysis programs, lowers risk due to information transfer or translation issues, and eliminates the need for additional software training.

MSC.Software – Gateway for LS-DYNA

Gateway for LS-DYNA provides you with the ability to access basic LS-DYNA simulation capabilities in a fully integrated and generative way. Accessed via a specific Crash workbench on the GPS workspace, the application enhances CATIA V5 to allow finite element analysis models to be output to LS-DYNA and then results to be displayed back in CATIA.

Oasys software for LS-DYNA

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.

Visual-CRASH For DYNA

Visual-Crash for 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. Visual Viewer performs automated tasks and generates customized reports therefore increasing engineers productivity..

APTEK

The MMCD is a graphics-based and menu-driven program that interfaces with the LS-DYNA library of material models and the LS-OPT optimization code. The core of the MMCD is the driver, which calculates the stress-strain behavior of material models driven by combinations of strain increments and stress boundary conditions, i.e. pure shear stress, and combinations of uniaxial, biaxial, and triaxial compression and tension. MMCD input and output is accessed via pre- and post-processors; graphical user interfaces (GUIs) for easily selecting the material model parameters and load histories, and for plotting the output in both two (stress-strain curves) and three (yield surfaces) dimensions. The pre-processor, driver, and post-processor are combined into a web downloadable software package that operates seamlessly as a single code.

BETA CAE Systems - ANSA

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

BETA CAE Systems - µETA

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

FEA Information Participants –

Company name takes you directly to Website

OASYS Ltd: Markets engineering software products. Consulting engineers, planners and project managers working in all areas of the built environment.

JRI Solutions Ltd.: Specializing in Research & Consulting; System Consulting, Frontier Business, System Integration and Science Consulting.

HP: Leading provider of high performance computing solutions for CAE, including workstations, servers, blades and storage..

ANSYS Inc.: Develops, markets, supports and delivers collaborative analysis optimization software tools.

SGI: Silicon Graphics, Inc., is a leader in high-performance computing, visualization, and storage.

MSC.Software: Information technology software and services provider.. Products & services used to enhance & automate the product design/manufacturing process.

NEC: A history of more than 100 years of leadership/innovation in the core high-technology sectors of communications, computers/electronic components

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INTEL: For more than three decades, Intel Corporation has developed technology enabling the computer and Internet revolution that has changed the world.

Engineering Technology Associates, Inc.: Provides engineering & IT services & has created the streamlined simulation software packages DYNAFORM and VPG

ESI Group: A software editor for the numerical simulation of prototype and manufacturing process engineering in applied mechanics.

BETA CAE Systems S.A.: Specialized in the development of state of the art CAE pre- and post-processing software systems.

FEA Information Participants –

Company name takes you directly to Website

APTEK: Among the software developed APTEK develops and licenses an interactive program for driving LS-DYNA material models - the Mixed Mode Constitutive Driver (MMCD).

PANASAS: High performing Parallel Storage for scalable Linux clusters. Delivering exceptional scaling in capacity and performance for High Performance Computing (HPC) organizations.

Intelligent Light: A a world leader in the development and delivery of software for computational fluid dynamics (CFD) users. We help the world's best engineering and research organizations maximize the productivity and impact of their CFD capabilities

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LS-DYNA® Software Distributors - Alphabetical order by Country

Australia	Leading Engineering Analysis Providers
Canada	Metal Forming Analysis Corporation
China	Arup
China	ETA China
France	Alyotech
France	AS+
Germany	CAD-FEM
Germany	DynaMore
India	Oasys, Ltd.
India	Cranes Software Ltd.
India	EASi Engineering
Italy	DynaMore
Italy	ENGINSOFT
Japan	The Japan Research Institute
Japan	ITOCHU Techno-Solutions Corporation
Japan	Fujitsu
Korea	Theme Engineering
Netherlands	Infinite Simulation Systems BV
Russia	State Unitary Enterprise - STRELA
Sweden	Engineering Research AB
Taiwan	Flotrend Corporation
USA	Engineering Technology Associates, Inc.
USA	Dynamax
USA	Livermore Software Technology Corp.
UK	ARUP

Consulting and Engineering Services

Australia	Leading Engineering Analysis Providers (LEAP) Greg Horner info@leapaust.com.au 02 8966 7888
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USA	KBEC L.C - (512) 363-2739 Khanh Bui kdbui@sbcglobal.net
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USA	Predictive Engineering - (1-800) 345-4671 George Laird george.laird@predictiveengineering.com
USA	Friedman Research Corporation (805) 683-1300
USA	Structure Technology (920).722.7060
USA	CAE Associates, Inc (203) 758-2914

Educational & Contributing Participants
Alphabetical Order By Country

China	Dr. Qing Zhou	Tsinghua University
India	Dr. Anindya Deb	Indian Institute of Science
Italy	Professor Gennaro Monacelli	Prode – Elasis & Univ. of Napoli, Frederico II
Russia	Dr. Alexey I. Borovkov	St. Petersburg State Tech. University
USA	Dr. Ted Belytschko	Northwestern University
USA	Dr. David Benson	University of California – San Diego
USA	Dr. Bhavin V. Mehta	Ohio University
USA	Dr. Taylan Altan	The Ohio State U – ERC/NSM
USA	Dr. Ala Tabiei	University of Cincinnati
USA	Prof. John D. Reid	University of Nebraska
USA	Professor Thomas Vasko	Connecticut State University

Informational Websites

The LSTC LS-DYNA Support site: www.dynasupport.com

LS-DYNA Support Site	FEA Informationwebsites
LS-DYNA Examples (more than 100 Examples)	LS-DYNA Conference Site
TopCrunch – Benchmarks	LS-DYNA Publications to Download On Line
LS-DYNA Publications	LSTC LS-PrePost Tutorials
CADFEM GmbH Portal	LS-OPT Support Site

LS-DYNA Training Centers in India - 2008

Oasys and nhance Engineering Solutions Pvt Ltd are pleased to announce training classes for LS-DYNA at Hyderabad, Bangalore and Pune in India.

LS-DYNA Advanced Crash Analysis Course:

Pune December 01 to 03 3 Days

This course has been designed with a greater emphasis on the automotive crash analysis and how LS-DYNA can be used to examine whether an automotive structure will meet the requirements. Workshops are run throughout the course, which uses the Oasys Suite of programs. Course contents are as follows:

- Overview of crash analysis
- Finite Element Modelling of vehicles in LS-DYNA
  - Guidance on mesh generation
  - Material and section data inputs
  - Connections - spotwelding, joints and springs
  - Modelling rigid parts and rigid connections
  - Defining accelerometers
  - Constraints, initial velocity and boundary conditions
  - Contacts and rigid barriers
  - LS-DYNA output definition
- Model checking
- Running LS-DYNA jobs
  - Runtime of an analysis
  - Speed-up via multi-processor runs and mass-scaling
  - Restarting analysis
- Post-processing analysis results
  - Comparison to test
  - Displacements, velocities, accelerations, deformed geometry, stress & strain, reaction forces, energy
  - Command files and automatic post-processing
  - Debugging models and trouble shooting

The size of class is limited to 10 trainees. We can also arrange training at your premises. Details of registration, cost & venue can be obtained by contacting:

Ms. Rafia Sultana - nhance Engineering Products (India) Pvt Ltd (Part of Arup Group), Plot No. 39, Ananth Info Park, Hi-tec City, Madhapur Phase 2, Hyderabad, India-500081
Tel: +91-40-44369797/98 **Fax:** +91-40-23111213 **Email:** India.support@arup.com

3rd ANSA & µETA International Conference

September 9-11, 2009
Olympic Convention Center
Porto Carras Grand Resort Hotel, Halkidiki, Greece

Being consistent to our biannual appointment and celebrating the 10 years since the establishment of **BETA CAE Systems S.A.**, it is our pleasure to invite you to participate in the **"3rd ANSA & µETA International Conference"**, to be held on September 9-11, 2009, in Porto Carras Grand Resort Hotel, Halkidiki, Greece.

More information:

Invitation - Call for papers - Free registration form
(download pdf file (2704KB))

Visit event's web page

Contact:

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Important dates:

- Abstracts submission: February 28,2009
- Acceptance notification: March 14, 2009
- Final manuscripts submission: June 20, 2009
- Registration until: June 30, 2009
- Event: September 9 - 11, 2009

Structural dynamic response of a track chain complete undercarriage system using a virtual proving ground approach

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The ITM Group Engineering Department uses advanced tools as finite element methods for static structural analyses of undercarriages, side frames or undercarriage components, such as track chain, rollers and tension devices. In order to integrate the recent prototype concepts into the design process, a new design procedure is proposed to design and to develop complete undercarriage systems. The procedure, which is briefly outlined in this article, will include full system real time dynamic simulations, able to represent a typical situation in operation manoeuvre, experimental test information, and 30 years experience of the ITM group.

The goal of the activities described here is to build up a new design procedure able to predict accurately structural responses of a track chain undercarriage system, starting from 3D parametrical CAD models, and exploiting the FEM analyses to investigate and point out characteristic dynamic phenomena under working conditions. The activities' logic flow was developed taking into account the ITM group technical and logistic requirements with the aim to maximize time efficiency of the new procedure and not just its effectiveness. For these reasons, the initial set-up of the FEM models has been carried out by using the ANSYS WB environment, which provides a parametrical CAD data integration and an easy-to-use hexahedral mesh tool. For model implementation and analyses launch preparations, the eta/VPG set of tools are used, in particular for mechanical system creation, contact definition, boundary and initial conditions conception.

Dynamic analyses have been performed by using the explicit finite element code LS-DYNA® while, for prediction of durability due to critical proving ground events and final fatigue response assessment, the eta/VPG fatigue/durability tool was applied. The basic idea behind the development of a new design procedure for a track chain undercarriage system, was to build up a methodology able to point out which CAE tool is needed to perform every single step of the design, how these tools can be integrated into a single work flow and if the whole procedure can be fitted into the ITM group design process. The activities were divided into four main phases:

- Assessment of the numerical models meshing all components and complete model implementation (component or sub-system joining, vehicle dynamic fixing, etc.)
- FEM simulation of a typical event of the working conditions by using the explicit finite element code LS-DYNA®
- Fatigue validation of the more critical parts by using the eta/VPG code
- Methodology feasibility study

In the first step, the original CAD models were fixed with the aim to get their compatibility with the FEM analyses (Fig. 1). This required to import into and repair in ANSYS WB each single CAD model of the track group with shoes (Fig. 2), roller, sprocket, idler, frame and tension devices. Later on, all the different parts were meshed with hexahedral elements (mesh parts are shown in Fig. 2-4).

Once imported into eta/VPG, the entire mesh model can be sketched as in Fig. 4, while Fig. 5 sketches the two rollers located in the inner part of the frame.
In the last step of this first phase, the working conditions of the track chain undercarriage system were assessed. The initial forces acting on the system were the external gravity and the

internal spring preload. Therefore, before evaluating the system's dynamic response, a preliminary analysis was performed with the aim to get the system equilibrium at time zero; Fig. 5 shows a comparison between the unloaded and loaded system.

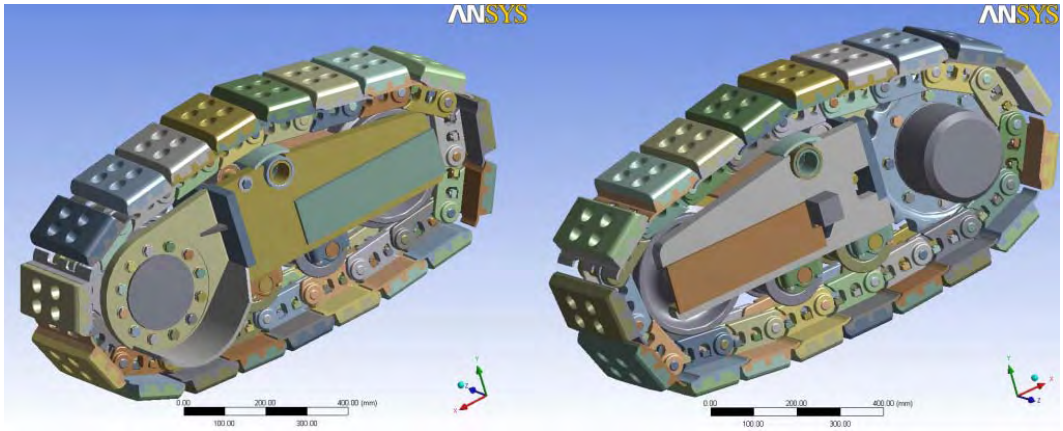

Fig.1: CAD model of the complete system

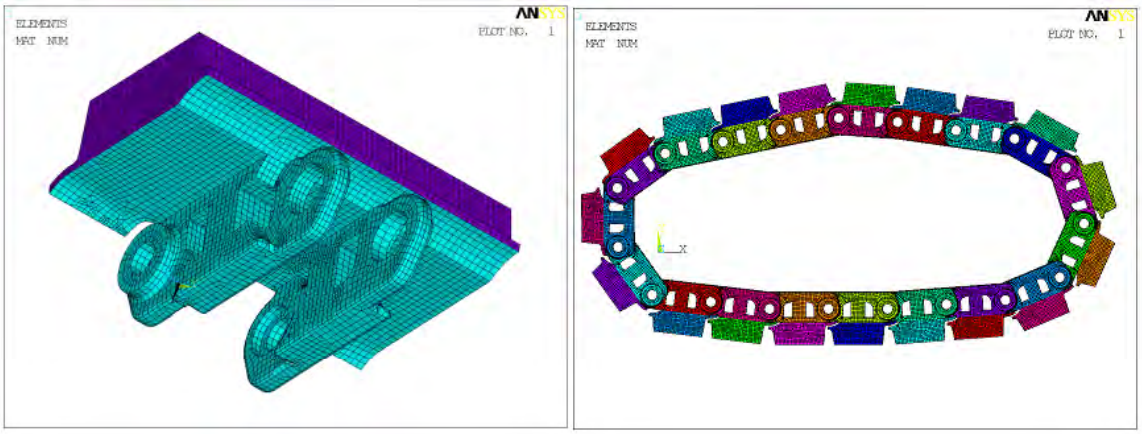

Fig.2: Track with shoes and complete chain FEM models

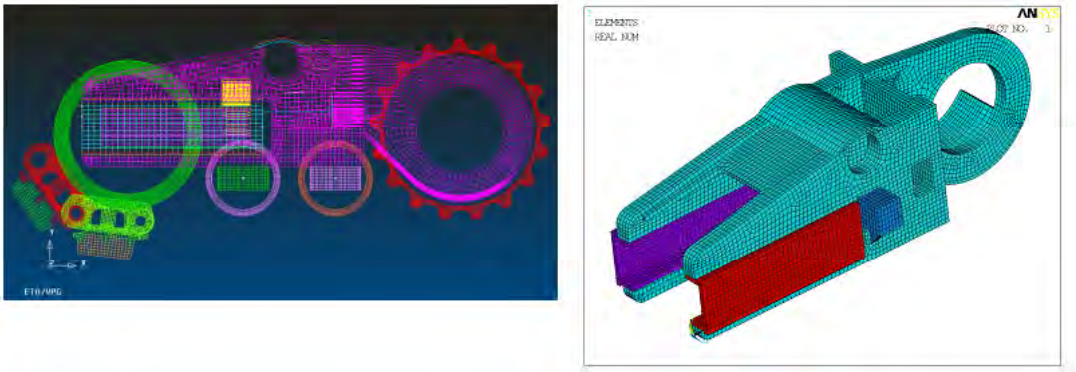

Fig.3: Frame FEM model

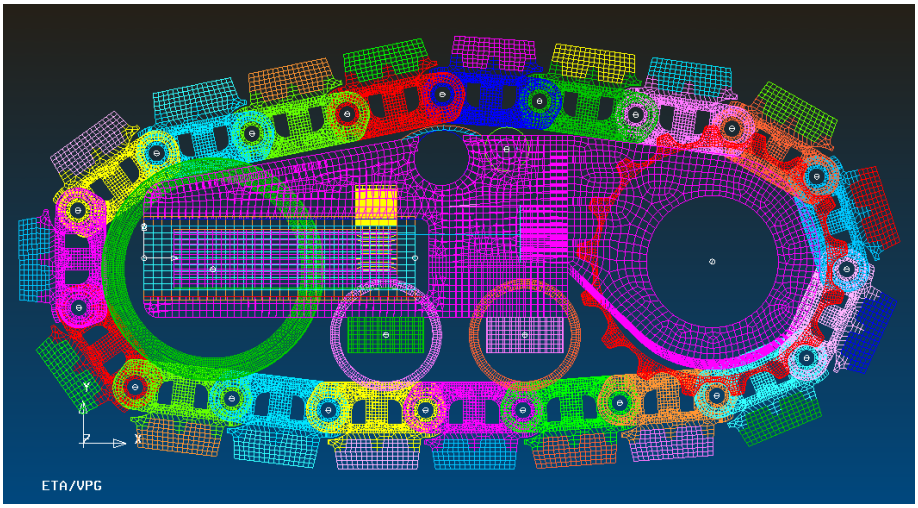

Fig.4: Model assembly of all meshed parts

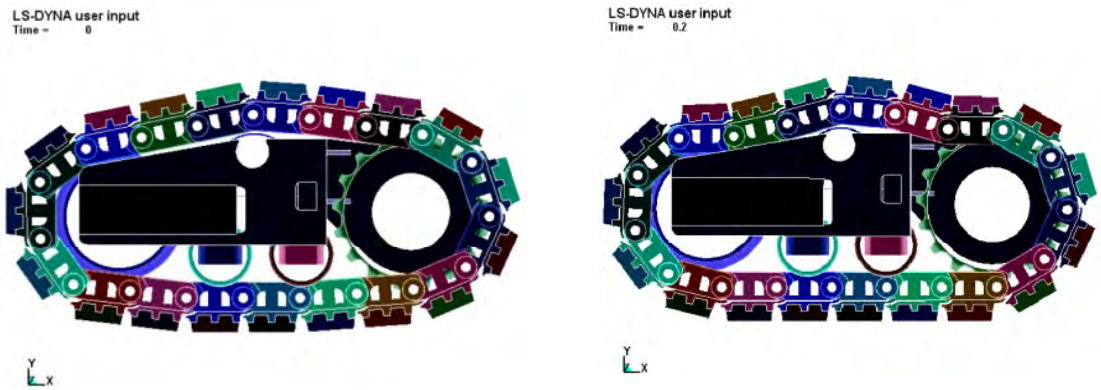

Fig.5: Gravity unloaded and loaded complete system

Once the initial and boundary conditions were assessed, as a typical working application, impact conditions were chosen and “the climbing over a step” phenomenon was studied.

In the third phase, the fatigue life of the system frame was investigated by using the eta/VPG code. Fatigue is a common failure mechanism of various components under cyclic loading. An accurate analysis of fatigue damage requires not only knowledge of the stress/strain history to which the component is subjected, but also a suitable method for cumulative damage summation. The eta/VPG Fatigue Post-Processor analyses and processes LS-DYNA® analysis results, predicting the life cycles that the selected system can sustain under given loading conditions. Different approaches exist according to the type of element used to mesh the component to be investigated. The frame was modelled by using solid elements, and therefore, the so-called Stansfield’s Approach had to be applied to predict the fatigue life.

The test case to be investigated is “the climbing over a step” (height of 30 mm) with the computation of frame acceleration and roller forces in the system dynamic response and the following evaluation of the frame fatigue life. Fig. 6 points out the two most critical regions of the frame, while Fig.7 and Fig.8 show a more focused area for both frame sides. One area corresponds to the hole connecting the undercarriage system with the remaining part of the machine (zone A), while the second one (zone B) is spread over the inner part of the drivetrain

hole. The minimum fatigue life is equal to $4.35*10^4$ cycles. These results are in good agreement with the ITM Group Engineering Department experiences.

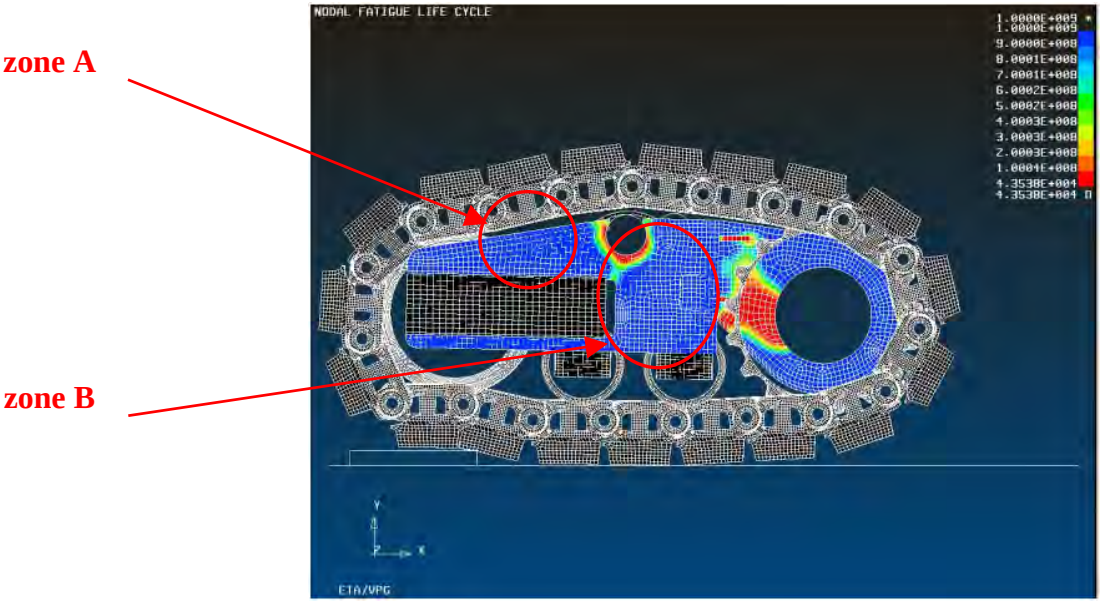

Fig.6: Fatigue life cycles

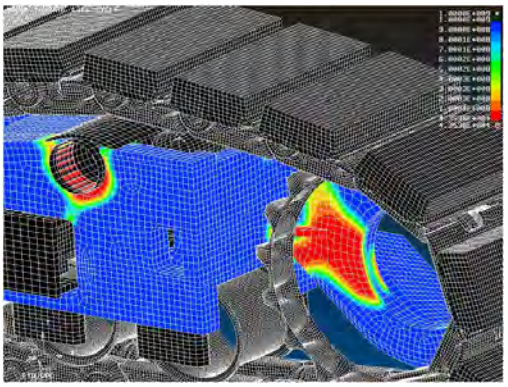

Fig.7: Side 1 of fatigue life cycles

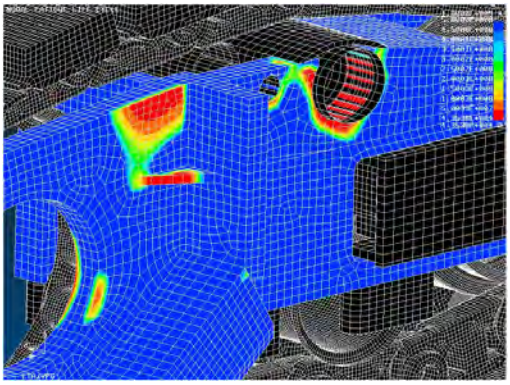

Fig.8: Side 2 of fatigue life cycles

Finally, a merits and limits analysis is performed in terms of quality simulation results, numerical model complexity, design procedure efforts and computational time needed. The results are then compared to the experiences of the ITM Group Engineering Department.

The following remarks are applicable:

- No severe geometric complexity of the components ➔ The building of FEM models is practicable
- The complete model can be easily built up in the ANSYS WB environment
- The phenomenon to reproduce is non linear dynamic
- Boundary and initial conditions can be easily applied in the eta/VPG environment

An evaluation of time required to perform the whole activity is described in the diagram in Fig. 9.

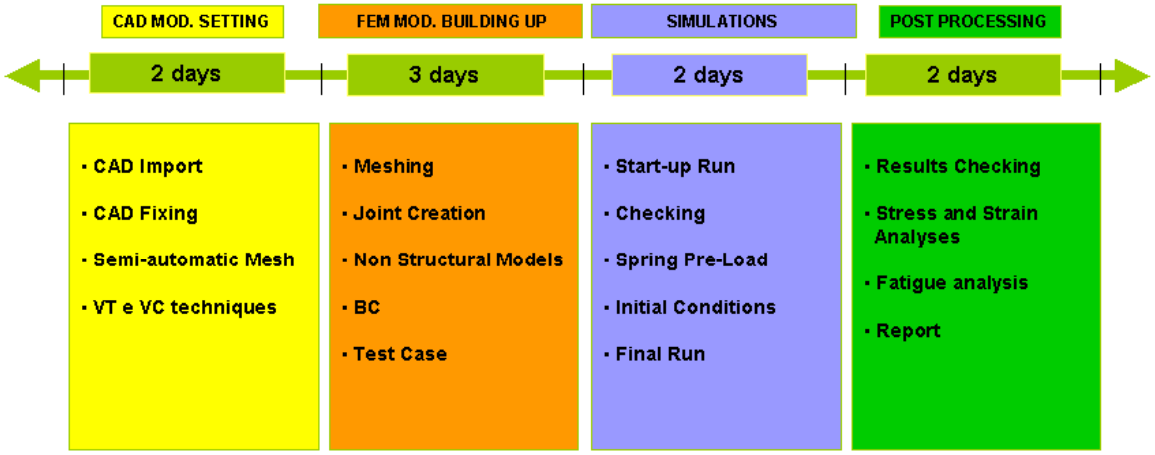

Fig. 9: Process integration into the ITM design chain