HyperWorks 2017: the comprehensive simulation platform

In March 2017, Altair released HyperWorks 2017: The Comprehensive Platform for Simulation and Innovation, with added functionality for open architecture CAE software platforms.

With its release of HyperWorks 2017®, Altair can offer new best-in-class technologies to design and optimise high-performance, efficient and innovative products. This latest release sees several functionalities added in areas such as model-based development, electromagnetism, nonlinear structural analysis, modelling and meshing, multi-physics and multi-disciplinary analysis, lightweight design and optimisation. New products and enhancement highlights include:

Model-based Development Suite: solidThinking Activate®, Compose® and Embed® capabilities encompassing concept studies, control design, system performance optimisation and controller implementation and testing are now part of the platform.

Electromagnetics Analysis and Design: Flux™ for EM simulation of static and low frequency applications, and WinProp™ for propagation modelling and radio network planning are added as perfect complements to FEKO, focused on high frequency EM simulations related to antenna design, placement, radiation hazard, bio electromagnetic.

Material Modelling and Manufacturing: Multiscale Designer is a tool for development and simulation of accurate models for heterogeneous material systems including laminated composites, honeycomb cores, reinforced concrete, soil, bones, and various other applications. Manufacturing offerings now include solidThinking *'Click2'* products for extrusion, casting and metal forming process simulation.

Usability and Efficient Model Management: HyperMesh® now offers a complete, robust solution for assembly and model variants management, expanding the part library and configuration management capabilities. Important new features for crash and safety users have also been implemented. A brand new desktop tool called ConnectMe™ has been developed to efficiently manage, launch and update all the products within the HyperWorks suite.

"HyperWorks 2017 adds key enhancements to the modelling and assembly capabilities of the software," says James Dagg, chief technical officer, user experience at Altair. "Users can now communicate directly with their enterprise PLM system, storing libraries of parts and configurations of their models. Tasks like setting up a model with multiple configurations for different disciplines can now be done in minutes."

Multiphysics Analysis and Performance: Major speed and scalability improvements have been implemented for all the Altair solvers. In particular, structural analysis capabilities for OptiStruct® have been further elevated to support the most complex nonlinear contact and material models. For fluid simulation (CFD), new turbulence and transition models have been implemented in AcuSolve to capture laminar to turbulent flow regime change.

In terms of computational performance, FEKO, OptiStruct, and RADIOSS leverage the most modern computer architectures and latest parallelisation technology to generate solutions faster and make them more scalable on compute clusters.

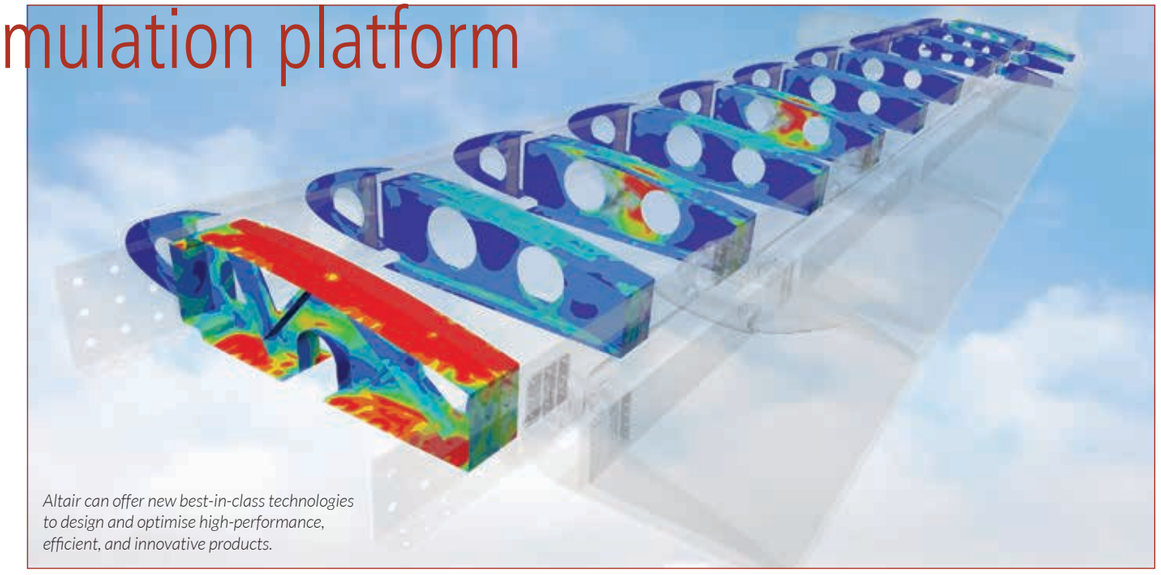
"With the HyperWorks 2017 release we followed our vision to continue focusing on simulation-driven innovation. We are now able to simulate more physics with improved high-performance computing (HPC)," says Uwe Schramm, chief technical officer, solvers and optimisation at Altair. "In particular, with the addition of Flux for low-frequency EM simulation, we're offering a complete multi-physics portfolio all linked through optimisation."

Simulation driven design on show in Hannover

Altair is to present HyperWorks 2017 at this year's Hannover Messe, along with its solutions and methods for simulation-driven design and a technology demonstrator of a virtual cobot (a collaborative robot), as well as customer examples to demonstrate how Altair's solutions can be applied to develop innovative products.

In addition, Altair will host: a "Design the Difference™" day, offering a conference programme that addresses the challenges and needs of engineers working on the development of increasingly complex products, featuring customer examples of successful product developments. The *Design the Difference* conference programme is included in the overall program of the CAE Forum and will take place on April 25th.

Today, product creators have to consider the entire mechatronic system, including its structure, sensors, actuators, controllers and much more. How these complex processes can be handled will be presented with a virtual cobot demonstrator, showing the challenges in the development of smart devices and offering solutions for innovative IoT products. From 1D to 3D; from sensors to optimised structures; as well as data analytics: these all required development steps that can be conducted and solved with Altair's software platform and its simulation-driven approach.



Altair can offer new best-in-class technologies to design and optimise high-performance, efficient, and innovative products.

How to handle manufacturing methods and smart materials are being showcased with exhibits of products by Altair customers. Among these the Robot Bike, a bike that combines carbon fibre and 3D printing technologies, resulting in a fully customisable, lightweight, and high strength mountain bike; PROTIQ's additively manufactured injection moulding tool, that offers unparalleled profitability through structural and thermal optimisation; and an example of a before welded component of a rocker arm for an agricultural soil tillage unit from AMAZONE, which is now caste having been optimised with respect to weight, material usage and durability.

Highlighted topics at the Altair stand include:

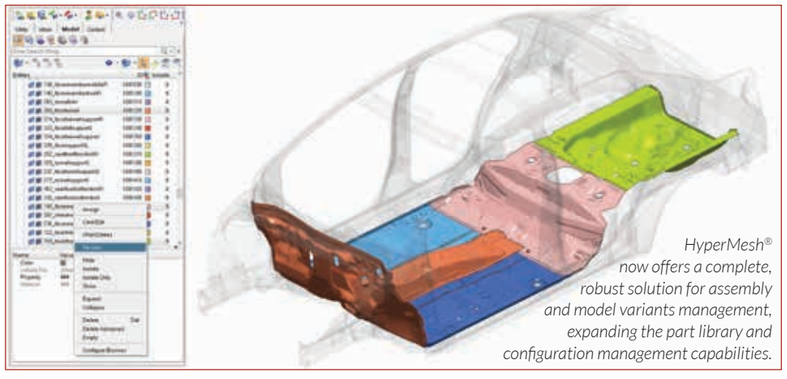
- Design processes for modern manufacturing methods.
- Electric efficiency.
- Smart material design.
- Connected model based engineering.
- System simulation.
- Industry 4.0, Cobots, Smart devices and the IoT.
- HyperWorks 2017, the most comprehensive CAE platform available today.

In addition, Altair is pleased welcome Laser Zentrum Nord GmbH as a co-exhibitor at this year's conference. Together the two companies will present their specific solutions for additive manufacturing, a collaboratively developed Design for *Additive Manufacturing* training programme as well as a joint case study of a bionic brake pedal.

"We are happy to welcome Laser Zentrum Nord at our booth," said Mirko Bromberger, director of marketing and additive manufacturing strategies at Altair Engineering. "The company is an important ally for us, especially with regards to new development and manufacturing processes, such as additive manufacturing. Visitors to Hannover Messe can expect a very broad and informative program, highlighting solutions for various production and engineering disciplines, smart materials, Industry 4.0 and much more."

Says, Frank Beckmann at Laser Zentrum Nord GmbH. "At our demo station at the Altair booth we will focus on our innovative technologies for metal additive manufacturing and will be showing, amongst other components, a 3D printed bionic brake pedal demonstrator, which was optimised using the Altair tools and manufactured following the processes we recommend for more efficiency in metal 3D printing. The structure of this demonstrator was optimised with the aid of topology optimisation against the background of light construction. The design was adapted for additive production in order to keep the number of support structures as low as possible. As a result, the need for after-treatment of the pedal is reduced to a minimum."

The agenda of Altair's Design the Difference programme covers the challenging journey engineers have to make when developing for Industry 4.0 and presents solutions and methods for simulation driven innovation by illustrating various industry examples on how to develop innovative products successfully, despite an increasing complexity. ❑



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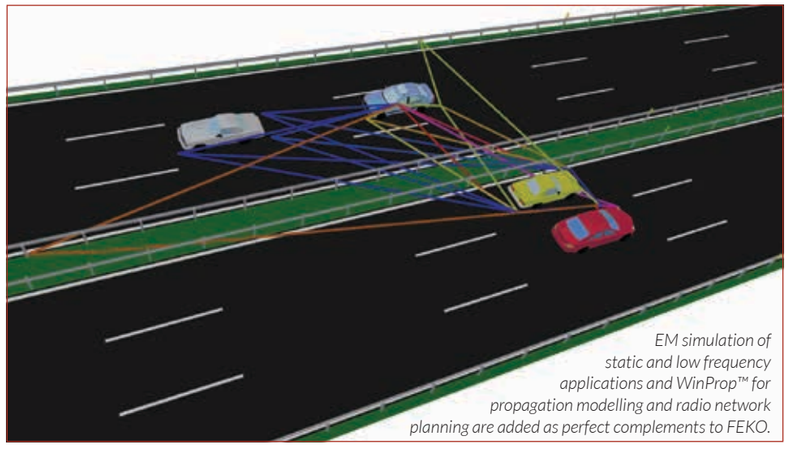
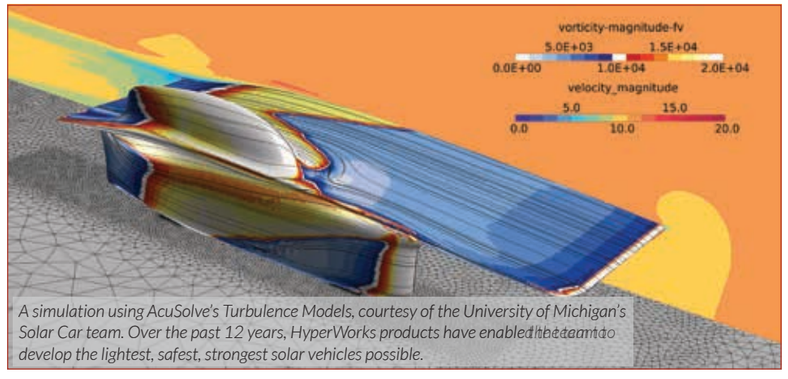


EM simulation of static and low frequency applications and WinProp™ for propagation modelling and radio network planning are added as perfect complements to FEKO.



A simulation using AcuSolve's Turbulence Models, courtesy of the University of Michigan's Solar Car team. Over the past 12 years, HyperWorks products have enabled the team to develop the lightest, safest, strongest solar vehicles possible.