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HYPERSIZER® SOFTWARE FROM COLLIER RESEARCH COMBINED WITH ABAQUS FEA SOFTWARE FROM SIMULIA USED ON NASA'S ARES V SPACE LAUNCH VEHICLE

Hampton, VA, September 16, 2009. Collier Research Corporation, developer of HyperSizer structural sizing software, has joined the SIMULIA partner ecosystem and has released an interface between HyperSizer and Abaqus FEA that allows engineers to streamline the process of composite design optimization. The optimized design is reached through rapid iterations between HyperSizer and Abaqus.

“Our partnership with Collier Research enables us to better serve the aerospace, energy, and other industries that want to optimize their products earlier in the design phase,” commented Tom Battisti, Director of Alliances, SIMULIA, Dassault Systèmes. “We continually strive to provide our customers with the tools they need to bring better products to market in less time and at lower cost. That’s exactly what the combination of Abaqus and HyperSizer enables them to do.”

Most recently, this solution was used on the design of NASA’s Ares V space launch vehicle which makes significant use of composites. During flight, the shroud of the Ares V separates into four petals to release the lunar lander. In the design of this structure, the aerodynamic pressure on the shroud is resolved into internally distributed forces. Abaqus determines the load path/direction and how much load is in the stiffened panel and the ringframe. HyperSizer then analyzes or “sizes” the panels’ cross-sectional dimensions and layups to the Abaqus computed load, reducing structural weight, establishing margins of safety for all load cases and all potential failure modes, and creating the stress report for aircraft airworthiness certification,” says Craig Collier, President of Collier Research.

HyperSizer software verifies structural integrity with the required calculations to predict all potential failure modes for all load cases and identify negative margins of safety. HyperSizer optimizes, or “sizes,” a design by surveying millions of candidate dimensions and laminates, finding optimum variables down to the ply level in a matter of minutes. Abaqus analysis technology is used to perform implicit and explicit finite element analysis, including static, dynamic, impact, and thermal analyses, all powered with robust contact and nonlinear material options. Optimization using Abaqus and HyperSizer follows an iterative process that begins with the transfer of data from Abaqus’ initial model to HyperSizer and continues until a convergence of internal load paths is reached, yielding a fully optimized structure. The Ares V’s payload shroud structure serves as an example of this optimization.

#### **About Collier Research Corporation**

Collier Research Corporation is a leading engineering software provider to the aerospace industry and NASA, providing structural tools, methods research, and software solutions with its flagship product, HyperSizer. As a trusted industry leader, HyperSizer provides aerospace stress analysis and sizing optimization, reducing the weight of aircraft and space vehicles, whether designed with composites or traditional metallic materials. HyperSizer is developed by engineers, for engineers, and is currently being used by NASA on the Crew Exploration Vehicle, the Ares I and Ares V launch vehicles, and by aerospace industry leaders such as Boeing, Lockheed Martin, Bombardier, and Gulfstream for commercial transport planes and business jets. For more information, visit [www.hypersizer.com](http://www.hypersizer.com).

**About SIMULIA**

SIMULIA is the Dassault Systèmes brand that delivers a scalable portfolio of Realistic Simulation solutions including the Abaqus product suite for Unified Finite Element Analysis, multiphysics solutions for insight into challenging engineering problems, and SIMULIA SLM for managing simulation data, processes, and intellectual property. By building on established technology, respected quality, and superior customer service, SIMULIA makes realistic simulation an integral business practice that improves product performance, reduces physical prototypes, and drives innovation. Headquartered in Providence, RI, USA, SIMULIA provides sales, services, and support through a global network of regional offices and distributors. For more information, visit [www.simulia.com](http://www.simulia.com).

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