Swansea University Leverages VABS Simulation Software for Morphing Helicopter Blades

West Jordan, Utah (USA), July 25, 2018- AnalySwift, LLC, a provider of efficient high-fidelity modeling software for composites, announced today that Swansea University has licensed its VABS simulation software for researching new helicopter rotor blades. The work is part of the broader European Union-funded research project, SABRE (Shape Adaptive Blades for Rotorcraft Efficiency), which seeks to develop quieter, more fuel-efficient helicopter blade morphing technologies.

The VABS program is a general-purpose cross-sectional analysis tool for computing beam properties and recovering 3D stresses and strains of slender composite structures. It is a powerful tool for modeling composite helicopter and wind turbine rotor blades, as well as other slender composite structures, such as propellers, landing gear, and high-aspect ratio wings.

"We are excited by the work being done by the Swansea University as part of their involvement in the SABRE research project and pleased they have selected VABS as part of their composite helicopter rotor blade optimization efforts," said Allan Wood, president & CEO of AnalySwift. "As a versatile cross sectional analysis tool, VABS delivers high-fidelity results early on, reduces design cycle, and shortens time to market."

The SABRE (Shape Adaptive Blades for Rotorcraft Efficiency) is a large, multi-partner H2020 research project funded by the European Union. The project team includes the University of Bristol, CIRA, DLR, TU Delft, TU Munich, and Swansea University. SABRE is developing ground-breaking new helicopter blade morphing technologies which will reduce helicopter fuel burn, CO_2, NOx and noise emissions by 5-10%. This will be done by tackling one of the most fundamental limitations on helicopter performance: the need for rotor blades to have a single fixed geometry which is inherently a compromise between widely different operating conditions. SABRE envisions shape adaptive blades continuously changing their shape to optimize performance in all conditions. Morphing technologies are being developed that can change the twist, camber, chord, and dynamic behavior of helicopter blades. In parallel, analysis work combines comprehensive, mixed-fidelity rotor models with morphing mechanism and emissions models to create the most detailed and comprehensive model of its type.

"One of the potential morphing concepts to change the blade twist during the flight is inertial twist," according to Michael Friswell, professor of engineering at Swansea University. "In this concept a composite blade with bend-twist coupling is designed to induce significant twist in the blade. The VABS software is used for high level optimization to design an equivalent composite cross-section with

fundamental frequencies close to the baseline blade, and also with high values of bend-twist coupling."

"The VABS program is a uniquely powerful tool for modeling composite blades, high aspect ratio wings, and other slender structures, commonly called beams," said Dr. Wenbin Yu, CTO of AnalySwift. "VABS reduces analysis time from hours to seconds by quickly and easily achieving the accuracy of detailed 3D finite element analysis (FEA) with the efficiency of simple engineering models. With VABS, engineers can calculate the most accurate, complete set of sectional properties such as torsional stiffness, shear stiffness, shear center for composite beams made with arbitrary cross-section and arbitrary material. It can also predict accurate detailed stress distribution for composite beams, which are usually not possible with 3D FEA for realistic composite structures."

About AnalySwift

AnalySwift, LLC is a provider of composite simulation software, which enables an unprecedented combination of efficiency and accuracy, including multiphysics structural and micromechanics modeling. Drawing on cutting edge university technology, AnalySwift's powerful solutions provide customers a competitive advantage through drastic reductions in engineering time, virtual testing earlier in the design process, and handling of more complex composite structures. Our technologies deliver the accuracy of detailed 3D FEA at the efficiency of simple engineering models, cutting analysis time by orders of magnitude. SwiftComp is licensed from Purdue Research Foundation. VABS is licensed from Utah State University, and Georgia Institute of Technology. AnalySwift is a member of the Institute for Advanced Composites Manufacturing Innovation (IACMI. Find out more at analyswift.com.

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