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Middle East Technical University Leverages VABS to Accelerate Design of Composite Wind Turbine Blades

North Logan, Utah (USA), July 11, 2016- AnalySwift, LLC, a provider of efficient high-fidelity modeling software for composites and other advanced materials, announced today Middle East Technical University (METU) is leveraging its powerful VABS software to accelerate design of composite wind turbine and helicopter rotor blades. METU has used VABS for a variety of projects in its Department of Aerospace Engineering and Center for Wind Energy or METU*Wind*, where it has aided in the accurate, yet rapid design of complex composite blades.

"We investigate the effect of fiber angle of the off-axis spar cap plies of composite blades on the load reduction that is achieved in the wind turbine system," said Dr. Altan Kayran, deputy director of METU*Wind* and professor in the Department of Aerospace Engineering. "We are using VABS to determine the cross-sectional properties of several GFRP and hybrid GFRP-CFRP bend-twist coupled blade designs that we have performed."

"VABS was very helpful in adjusting the proper stiffness of the bend-twist coupled blade designs since the design of bend-twist coupled blades required many design changes involving ply numbers to achieve the proper sectional stiffness values," added Dr. Kayran. "With the speed of VABS we were able to finish many designs in a very timely manner. "

Researchers at METU have used VABS recently in multiple studies, including an evaluation of aeroelastic stability of bend-twist coupled composite wind turbine blades designed for load alleviation in wind turbine systems. It was also used in a comparative study of finite element analysis and geometrically exact beam analysis of a composite helicopter blade, as well as project related to the reduction of fatigue damage equivalent loads in the wind turbine system through the use of off-axis plies in the spar caps of composite wind turbine blades. Graduate students at METU involved in this research include PhD students Touraj Farsadi and M. Ozan Gözcü, as well as master's students Özgün Şener and M. Nisa Ataç.

"The VABS program is a uniquely powerful tool for modeling composite blades and other slender structures, commonly called beams," said Allan Wood, president & CEO of AnalySwift. "VABS reduces analysis time from hours to seconds by quickly and easily achieving the accuracy of detailed 3D 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," said Dr. Wenbin Yu, CTO of AnalySwift. "It can also predict accurate detailed stress distribution for composite beams."

With continuous development spanning 20 years for performance and robustness, VABS is used in the aerospace and wind energy industries for modeling complex composite rotor blades, wing section design, and simulating other slender composite structures. Developed at Georgia Institute of Technology (Georgia Tech) and Utah State University, VABS is available through AnalySwift at analyswift.com.

About AnalySwift
AnalySwift, LLC is a provider of composite 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. Licensed from Purdue University, Utah State University, and Georgia Institute of Technology, our technologies deliver the accuracy of detailed 3D FEA at the efficiency of simple engineering models, cutting analysis time by orders of magnitude. Find out more at analyswift.com.

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