ELECTRIFIED AIRCRAFT PROPULSION APPROACHES FOR MODELING AND ELECTRICAL HARDWARE-IN-THE-LOOP TESTING

SPEAKERS

Joseph Connolly

Deputy Project Manager of Technology
Electrified Powertrain Flight Demonstration Project - NASA Glenn Research Center

Joseph Haglage

Hybrid Thermally Efficient Core Project Chief Engineer
NASA Glenn Research Center

About The Speaker:

Joseph Connolly:

Joseph Connolly is the Deputy for Electrified Aircraft Propulsion (EAP) Integration at the NASA Glenn Research Center. In this position Joseph works to support EAP technology development across aeronautics projects. Joseph also serves as the Deputy Project Manager of Technology for the Electrified Powertrain Flight Demonstration Project and a technical lead for the Hybrid Electric Thermally Efficient Core Project. Joseph earned his B.S. in Aerospace Engineering from the Ohio State University, his M.S. in Control Systems from Case Western Reserve University, and his PhD in Aerospace Engineering from the Ohio State University.

Joe Haglage:

ABSTRACT

This tutorial session outlines capabilities made available by the National Aeronautics and Space Administration for testing electrified aircraft propulsion (EAP) hardware and software prior to using turbomachinery. Removing these components from the experimentation process until necessary significantly reduces the development and testing costs and safety risks. Three facilities, the NASA Electric Aircraft Testbed (NEAT) and the Hybrid Propulsion Emulation Rig (HyPER) are unique facilities that provide the following capabilities: (i) the verification of megawatt scale electrical and electromechanical system components at altitude, (ii) the verification of EAP control systems on sub-scale representative electromechanical architectures. The importance, operation, and specifications of each facility is described with detail. Provided examples of past testing showcase the abilities of each facility. Simple and complex methods for replicating the steady state and dynamical mechanical loading on the electrical power system are discussed.