Automation of US Air Force Bench Top Wind Tunnels

Requirements & Implementation

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Abstract

The United States Air Force Precision Measurement Equipment Laboratories (PMEL) calibrate over 1,000 anemometer probes per year. To facilitate a more efficient calibration process for probe-style anemometers, the Air Force Metrology and Calibration Program underwent an effort to modernize the existing PMEL bench top wind tunnels. Through a joint effort with the Department of Energy's Oak Ridge National Laboratory, the PMEL wind tunnels were improved. The improvement consists of new high accuracy sensors, automatic data acquisition, and a software-driven calibration process. The following paper discusses the requirements for the wind tunnel improvements along with actual implementation strategies and details.