NASA SBIR/STTR Technologies

Long-Range Non-Destructive Testing System

P.I.: Cecil Hess, Ph.D. – MetroLaser, Inc., Irvine, CA

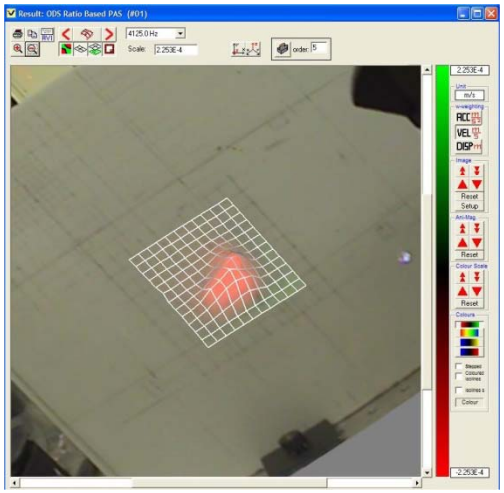
Proposal No: 10-A4.02-9579

Identification and Significance of Innovation

The innovation is a versatile laser Doppler vibrometer system that can do both modal analysis (MA) and non-destructive inspection (NDI) of arbitrary surfaces from a standoff distance of up to 15 meters. The system would be applied to aircraft structures, and would have the ability to measure composite, metallic, and other types of components.

Expected TRL Range at the end of Contract (1-9): 6

LDV signal showing defect on composite test coupon



Technical Objectives and Work Plan

There were three primary technical objectives of the Phase I effort. First, to demonstrate that LDV technology could be used for both modal analysis and defect detection on aircraft components. Second, to develop a system architecture for a single LDV system capable of performing both of these functions. And third, to develop a conceptual design for an LDV system capable of operation at distances of up to 15 meters with an eye-safe laser wavelength. The Phase I Work included experimental breadboard demonstrations of modal analysis and defect detection on sample test coupons.

NASA and Non-NASA Applications

NASA applications include non-destructive testing of modern aircraft and components, noise and vibration studies of advanced aircraft engines and new rocket engines, and vibrational response of wind tunnel models.

Other applications include non-destructive testing of airplanes, noise and vibration measurements of automobiles and components, structural mechanics, vibrational response of prosthetics, and numerous impact studies in the military.

Firm Contacts

Dr. Cecil Hess, PI - MetroLaser, Inc. (949) 553-0688 x223
Ms. Christina Arnold, Dir. of Admin. - MetroLaser (949) 553-0688 x241

NON-PROPRIETARY DATA