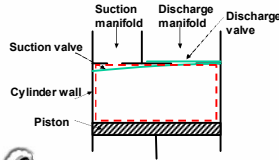


Project: Multi-Cylinder Compressor Modeling and Simulation

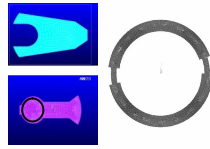
Sponsors: Sanden Corporation

Goals: Model and simulate compressor thermodynamics, valve dynamics, and manifold acoustics to identify design changes leading to reduced operational noise.

Cylinder control volume



Valve and manifold design changes



Purdue University - School of Mechanical Engineering - Ray W. Herrick Labs

Project: Model Identification and Vibration Control for Exhaust System

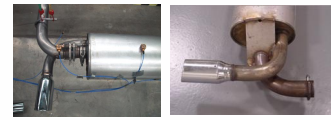
Sponsors: ArvinMeritor

Goals: Develop experimental sensitivity techniques for deriving dynamic model of an exhaust system, and identify optimal design changes to reduce structure-borne noise/vibration.

Exhaust system tested



Design changes implemented



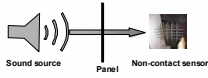
Purdue University - School of Mechanical Engineering - Ray W. Herrick Labs

Project: Material Damage Modeling and Detection Using Acoustic Transmission

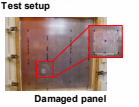
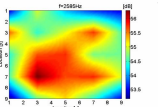
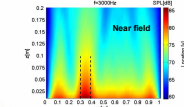
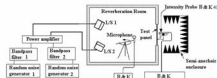
Sponsors: Air Force Research Laboratory Materials Directorate

Goals: Use a non-contact means of sensing to identify material damage in metallic panels.

Material Damage Modeling



Acoustic Transmission Testing



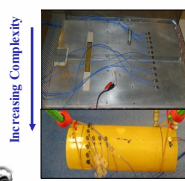
Purdue University - School of Mechanical Engineering - Ray W. Herrick Labs

Project: Damage Identification in Structural Systems

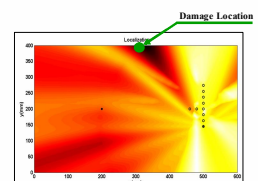
Sponsors: Air Force Research Lab

Goals: Identify damage in a variety of specimens using propagating waves and active piezoelectric arrays.

Structural Specimens



Damage Identification



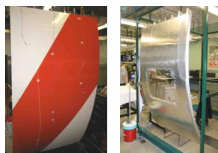
Purdue University - School of Mechanical Engineering - Ray W. Herrick Labs

Project: Effects of Fuselage Window on Structure and Airborne N&V

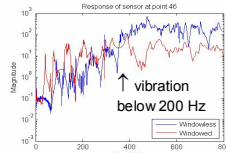
Sponsors: U.S. Coast Guard

Goals: Identify possible changes in the vibration and noise environment inside of a C-130J fuselage due to insertion of window to enable search and rescue missions.

Fuselage panels tested



Changes observed in vibration



Purdue University - School of Mechanical Engineering - Ray W. Herrick Labs