

MECHANICAL ENGINEERING DEPARTMENT
ME/ISyE 8773-8774

Flow Excited Helmholtz Resonators

by

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Wednesday, February 6, 2008
3:15 p.m. — Refreshments before the seminar
3:30 p.m. — Graduate Seminar
Room 1130 ME

ABSTRACT — A volume of compressible fluid with a single orifice can be considered as a type of Helmholtz resonator. When a cross flow is present over the orifice, the unstable free shear layer that forms can interact with the acoustic properties of the enclosed volume to produce a self-sustained resonance. Two common examples of this phenomenon include blowing over a bottle, or driving at moderate speeds in a vehicle with one window lowered. The seminar will present an analytical treatment that describes the vortical-acoustic interactions. Detailed experimental measurement results have been obtained, and will be used to provide additional insight. Finally, a model is proposed and tested against a number of experimental trials, including a full scale vehicle.

BIO — **Prof. Scott Morris** has completed a Master of Science in Mechanical Engineering in 1997, Master of Science in Applied Mathematics in 2001, and PhD in Mechanical Engineering in 2002, all at Michigan State University. He has been on the faculty as an assistant professor at the university of Notre Dame since 2002, and currently directs research in the areas of turbulent flows, acoustics, and turbomachinery.

Informal Faculty Luncheon: Wednesday, January 23, 2008, 12:00 noon. Meet in 1100 ME and walk to lunch with other faculty. Prof. Morris will be able to attend.