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Laboratory: Damage Science & Mechanics Laboratory

Current Areas of Emphasis: Research regarding deterioration of materials and mechanics of how deterioration causes damage, development and application of structural health monitoring (SHM) and nondestructive evaluation (NDE) ; research, development and application of all forms of energy for materials characterization; champion the switch to a “sustainable-design paradigm” and development of SHM/NDE engineers.

Application Areas:

- Using SHM and NDE to predict strength and durability limit states
- SHM and NDE for preservation of transportation structures
- SHM and NDE of service induced deterioration, precursor damage, and subsequent critical damage for metal alloys components and structures
- SHM and NDE of service induced deterioration, precursor damage, transitions of precursor damage to critical damage of composite materials and structural components; forewarning of end of functional service life.
- Ultrasound interaction with multilayered structures
- Thermal monitoring of mechanical mean and cyclic stresses and changes associated with deterioration

Expertise: Identification of appropriate measurement approaches and the integration of equipment, instrumentation, and software for accomplishing difficult measurement tasks

Examples of Funding Sources: Department of Commerce, Federal Highway Administration, U.S. Department of Defense, U.S. Department of Energy, NASA ; variety of industrial sponsors; numerous SBIR and STTR collaborations

Technical Philosophy: No smoke, no wool pulling, no malarkey... data from measurements are preferred to expectations and estimations