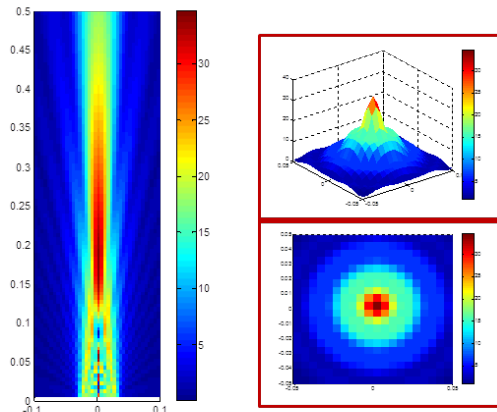
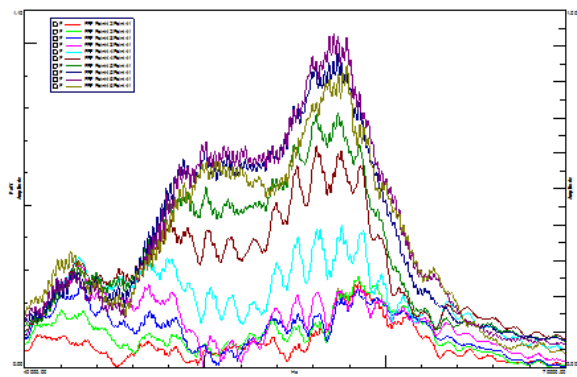
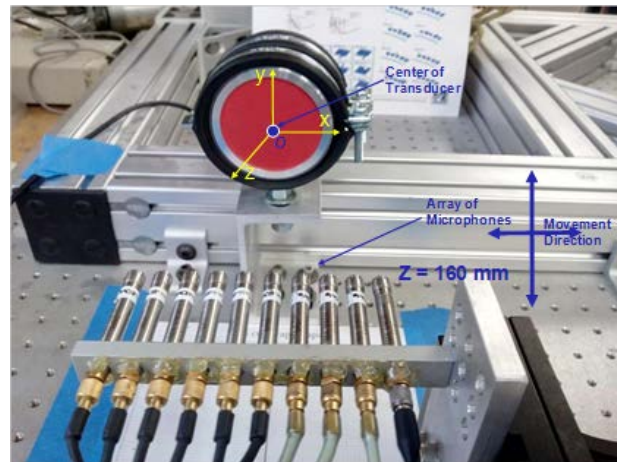
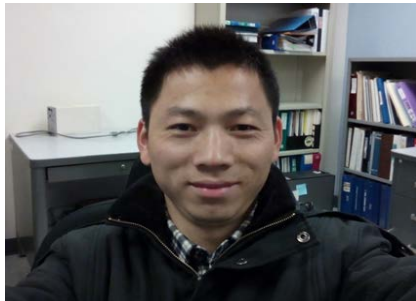




PHD DISSERTATION – SONGMAO CHEN

**Enabling Noncontact Structural Dynamic Identification
with Focused Ultrasound Radiation Force**



A laboratory noncontact excitation method based on the focused ultrasound radiation force, generated by an ultrasonic transducer is being exploited to excite vibrations within structures with size ranging from micro to macro and frequency range from a few kHz to 1 MHz, for potential applications in modal testing. However, the inability to monitor the real time acoustic radiation force prevents this approach from being used as a practical technique for measuring the frequency response functions (FRFs) in modal testing. Thus, this research focuses on the acoustic modeling, mapping, acoustic radiation pressure and force monitoring using both traditional microphones and novel point-type fiber optic pressure sensors theoretically as well as experimentally by means of state-of-the-art simulation and testing tools like MATLAB, Polytec Scanning Vibrometer and LMS Test.Lab. Modal testing applications are to be conducted and deeper understanding of this noncontact excitation technique is to be acquired.