Dan Baima 11/9/14

OCE 496 Bridge Team

Piezoelectric Exciters Background Research & Sources

**LASER Doppler Vibrometry for the Characterisation of the Dynamic**

**Behaviour of Structures Excited by Piezoelectric Exciters**

<http://sem-proceedings.com/21i/sem.org-IMAC-XXI-Conf-s24p01-Laser-Doppler-Vibrometry-Characterisation-Dynamic-Behaviour-Structures.pdf>

* Vibration analysis and characterizing dynamic behavior of small and light structures
* Laser Doppler Vibrometry is a well-known technique for the determination of the surface velocity in vibrating structures
* Piezoelectric crystals (exciters which are light and easy to be applied to surface of test object)

**A Resonant Damping Study Using Piezoelectric Materials**

<http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20080047738.pdf>

* NASA, concerned with turbomachinery high cycle fatigue(HCF)
* Feasibility study of resonant damping control using piezoelectric patches
* Passive and active control techniques

**Embedding Actuation Functionalities in a Wireless Structural Health Monitoring System**

<http://www-personal.umich.edu/~jerlynch/papers/HawaiiWS04Paper.pdf>

This paper describes a prototype wireless actuation and sensing unit which is intended:

(1) To collect measurement data from sensors embedded within structural elements that are

excited by low-energy actuation elements

(2) To store, manage and locally process the measurement data collected

(3) To communicate data and results to a structural monitoring system network.

**Generation of axial modes in the nonlinear vibration of strings**

<http://webistem.com/acoustics2008/acoustics2008/cd1/data/articles/003496.pdf>

**The Vibration of Continuous Structures**

<https://engfac.cooper.edu/pages/tzavelis/uploads/Transverse%20vibration%20of%20beams.pdf>

**The Study on Nonlinear Dynamic Behaviors of the Structures with Bolted-Flange Joint**

<http://iopscience.iop.org/1757-899X/10/1/012172/pdf/1757-899X_10_1_012172.pdf>

**Linear vibration actuator utilizing combined bending and longitudinal vibration modes**

<http://www.google.com/patents/US5936328>

A vibration driven actuator includes a vibration member for causing an electro-mechanical energy conversion element to excite bending and longitudinal vibrations, and producing a driving force by using specific vibrations obtained by synthesizing the bending and longitudinal vibrations, and a projection portion formed at a position, on at least one of the energy conversion element and the vibration member, which corresponds to a node of the bending vibrations. The projection portion is used for supplying a signal to the energy conversion element.