Thirteenth Conference On Nonlinear Vibrations, Dynamics, and Multibody Systems

May 23 - 27, 2010
Program

Chairman

Ali H. Nayfeh

Department of Engineering Science and Mechanics
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061
Revisited modeling and resonant nonlinear vibrations of laminated composite plates
G. Rega and E. Saetta, Sapienza Università di Roma, Roma, Italy

Free vibration of composite plates with mixed boundary conditions based on higher-order shear deformation theory
E. Asadi, Mississippi State University, Starkville, MS, S. J. Fariborz, Amirkabir University of Technology, Tehran, Iran, and S. Taheri, Virginia Tech, Blacksburg, VA

On the dynamics of snap-through of bi-stable composite plates
A. F. Arrieta, S. A. Neild, D. J. Wagg, University of Bristol, Bristol, UK, and P. Hagedorn, TU Darmstadt, Darmstadt, Germany

Computation of periodic solutions and their regions of attraction for flexible structures under nonlinear feedback control
M. Borre and H. Flashner, University of Southern California, Los Angeles, CA

Bifurcation analysis of aircraft main landing gear shimmy
C. Howcroft, B. Krauskopf, and M. Lowenberg, University of Bristol, Bristol, UK

Study of the snap through behavior of an axially loaded beam carrying a central mass
P. Cette and B. P. Mann, Duke University, Durham, NC

Analysis on chaotic vibrations of a post-buckled L-shaped beam with an axial constraint
N. Onozato, K. Nagai, S. Maruyama, and T. Yamaguchi, Gunma University, Gunma, Japan

Nonlinear resonant behaviour of semi-infinite cables resting on a unilateral elastic substrate
L. Demeio and S. Lenci, Università Politecnica delle Marche via Brecce Bianche, Ancona, Italy

Multi-frequency analysis of the multi circular plate system nonlinear dynamics
K. R. Hedrih, Mathematical Institute SANU, Belgrade, Serbia and J. D. Simonović, University of Niš, Niš, Serbia

A nonlinear visco-elastoplastic impact model and the coefficient of restitution
A. S. Yigit, A. P. Christoforou, and M. A. Majeed, Kuwait University, Safat, Kuwait

Nonlinear dynamics of granular chains
Y. Starosvetsky and A. F. Vakakis, University of Illinois at Urbana-Champaign, Urbana, IL
Monday, May 24
1200-1330 - Lunch
1330-1500 – Session 3.
Co-Chairs: B. Mann and D. D. Quinn

Hysteresis-based nonlinear vibration absorbers
N. Carpineto, W. Lacarbonara, and F. Vestroni, Sapienza University of Rome, Rome, Italy

Reduction of forced vibrations of a system of coupled rigid bodies by means of dynamic vibration absorbers
D. A. Chebanov, LaGuardia Community College of The City University of New York, Long Island City, NY, A. M. Kovalev, I. A. Bolgrabskaya, and V. F. Shcherbak, Institute of Applied Mathematics and Mechanics of The National Academy of Sciences of Ukraine, Donetsk, Ukraine

Analytical modeling of a distributed vibration absorber with sinusoidally woven spring layer using equivalent orthotropic plate properties
R. L. Harne and C. R. Fuller, Virginia Tech, Blacksburg, VA

Nonlinear transient dynamics of pendulum vibration absorbers
R. J. Monroe, S. W. Shaw, Michigan State University, East Lansing, MI, and B. K. Geist, Chrysler Group LLC, Auburn Hills, MI

The effects of Coulomb friction on the performance of centrifugal pendulum vibration absorbers
B. J. Vidmar, B. F. Feeny, S. W. Shaw, A. G. Haddow, Michigan State University, East Lansing, MI, and B. K. Geist, Chrysler Group LLC, Auburn Hills, MI

Monday, May 24
1500-1530 - Break
1530-1700 – Session 4.
Co-Chairs: S. Shaw and K. R. Hedrih

Some instability issues in flexible multi-body dynamics
E. Wang, Southern Illinois University Edwardsville, Edwardsville, IL and R. A. Wehage, Caterpillar, Inc., Mossville, IL

Nonlinear behavior of a two-dof piecewise linear aeroelastic system
T. Elgohary and T. Kalmár-Nagy, Texas A&M University, College Station, TX

Suppression of LCO of a swept wing in transonic flow by targeted energy transfer
D. M. McFarland, University of Illinois at Urbana-Champaign, Urbana, IL, S. A. Hubbard, NES Technologies, Inc., Champaign, IL, A. F. Vakakis, and L. A. Bergman, University of Illinois at Urbana-Champaign, Urbana, IL

Nonlinear model of squeeze flow of magneto-rheological fluids using perturbation methods
A. Farjoud, N. Mahmoodi, and M. Ahmadian, Virginia Tech, Blacksburg, VA

Supercavitating vehicles: modeling, nonlinear dynamics, and control
M. A. Hassounah, V. Nguyen, B. Balachandran, and E. H. Abed, University of Maryland, College Park, MD
On the stability of bipedal locomotion
F. Bauer and W. Seemann, Karlsruhe Institute of Technology, Karlsruhe, Germany

A self-tuning fuzzy-sliding mode controller for under-actuated ships
N. Khaled and N. G. Chalhoub, Wayne State University, Detroit, MI

Vibration suppression by parametric excitation in the case of non-conservative systems
H. Ecker and B. Petermeier, Vienna University of Technology, Vienna, Austria

Terminal sliding mode controllers for a heat exchanger system
N. B. Almutairi and M. Zribi, Kuwait Univesity, Safat, Kuwait

On nonlinear normal modes in a weakly nonlinear system with internal resonances
T. D. Burton, K. E. Deines, and J. A. Mercer, New Mexico State University, Las Cruces, NM

Frequency islands in the primary resonance of nonlinear delay systems
K. A. Al-Hazza, Kuwait University, Safat, Kuwait, M. F. Daqaq, Clemson University, Clemson, SC, and G. W. Vogl, NIST, Gaithersburg, MD

Applying the Liapunov-Floquet transformation to periodic delay differential equations discretized by the Chebyshev spectral continuous time approximation
E. A. Butcher and O. A. Bobrenkov, New Mexico State University, Las Cruces, NM

Stability and equilibria of a pivoting fluid-filled cylinder
B. P. Mann, Duke University, Durham, NC

Solution of delay differential equations by the enhanced multistage homotopy perturbation method
D. Olvera, A. Elias-Zúñiga, Tecnológico de Monterrey, Monterrey, Mexico, L. N. López de Lacalle, and C. A. Rodríguez, University of the Basque Country, Bilbao, Bizkaia, Spain

On nonlinear friction induced vibrations: bifurcation analysis of brake squeal
H. Hetzler, Karlsruhe Institute of Technology, Karlsruhe, Germany
**Response of a multi-bilinear spring support structure**

_**T. Gilliam**_ and S. W. Smith, University of Kentucky, Lexington, KY

Domains of attraction and stability boundaries of self-excited mechanical systems

_**D. Hochlenert**_, Technische Universität Berlin, Germany

Numerical methods for non-smooth non-linear dynamics: application to friction-induced instabilities

_**A. Loyer**_, SNCF Innovative and Research Department, Paris, France, J.-J. Sinou, UMR 5513 cole Centrale Lyon, cully Cedex, France, O. Chiello, INRETS, BRON Cedex, France, and X. Lorang, SNCF Innovative and Research Department, Paris, France

An atomic force microscopy tapping mode vibration: on nonlinear dynamics behavior and an optimal control design to suppress chaotic motions

_**J. M. Balthazar**_, A. M. Tuseet, UNESP- Univ Est paulista, Rio Claro, Brazil and A. H. Nayfeh, Virginia Tech, Blacksburg, VA

Performance and dynamics of a spherical robot: the rollbot

_**K. Asfar**_, C. Satkoski, S. Mader, M. Schmidt, J. Sombart, and E. Shaw, Purdue University, West Lafayette, IN

**Shimmy analysis of a nose landing gear with freeplay using hybrid dynamical systems**

_**P. Thota**_, B. Krauskopf, M. Lowenberg, University of Bristol, Bristol, UK

Frequency response behavior of microcantilevers in intermittent-contact atomic force microscopy

A. Delnavaz, Sharif University of Technology, Tehran, Iran, _**S. N. Mahmoodi**_, Virginia Tech, Blacksburg, VA, N. Jalili, Northeastern University, Boston, MA, and H. Zohoor, Sharif University of Technology, Tehran, Iran

Second derivative and coordinate frames

_**R. N. Jazar**_, RMIT University, Melbourne, Australia

Multiple scales analysis of wave-wave interactions in a cubically nonlinear monoatomic chain

_**K. L. Manktelow**_, M. J. Leamy, and M. Ruzzene, Georgia Institute of Technology, Atlanta, GA

Modal reduction and nonlinear oscillations of an atomic force microscope using nonlinear normal modes

_**N. Apiwattanalunggarn**_, Kasetsart University, Bankok, Thailand
Dynamic vibration absorber for turning operation employing ineters
A. Elías-Zúñiga, O. Martínez-Romero, and F. I. Compeán R., Tecnológico de Monterrey, Monterrey, Mexico

Period one chatter instability of variable pitch milling tools
A. R. Yusoff and N. D. Sims, University of Sheffield, Sheffield, UK

Stability lobes in end-milling operations by the enhanced multistage homotopy perturbation method
D. Olvera, A. Elías-Zúñiga, Tecnológico de Monterrey, Monterrey, Mexico, L. N. López de Lacalle, and C. A. Rodriguez, University of the Basque Country, Bilbao, Bizkaia, Spain

Nonlinear rigid body dynamics of accelerating articulated rotor blades
M. Ghorashi, University of Southern Maine, Gorham, ME

Analysis and control of parametrically excited nonlinear systems via order reduction
A. Gabale and S. C. Sinha, Auburn University, Auburn, AL

Van der Pol type self-excited oscillation of cantilever by integral feedback
H. Kato, H. Yabuno, Keio University, Yokohama City, Kanagawa, Japan, T. Someya, University of Tsukuba, Tsukuba, Ibaraki, Japan, and M. Kuroda, National Institute of Advanced Industrial Science and Technology, Tsukuba, Ibaraki, Japan

Noise enhanced performance of nonlinear oscillators: entropy studies
S. B. Telly, E. Perkins, D. Shrestha, and B. Balachandran, University of Maryland, College Park, MD

Natural frequencies of electrically actuated carbon nanotube resonators
H. M. Ouakad and M. I. Younis, State University of New York at Binghamton, Binghamton, NY

The effects of noise and parameter sweep rate on bifurcation detection
N. J. Miller, S. W. Shaw, and M. I. Dykman, Michigan State University, East Lansing, MI

Equilibrium and stability of rectangular liquid-filled vessels
R. Trahan III and T. Kalmár-Nagy, Texas A&M University, College Station, TX

On the effects of higher-order nonlinearities on the frequency characteristics of vibrating microbeams
H. Dankowicz, University of Illinois at Urbana-Champaign, Urbana, IL and W. Lacarbonara, Sapienza University of Rome, Rome, Italy

On the dynamics of a beam with switching crack and damaged boundaries: application of the local equivalent linear stiffness method
M. A. AL-Shudeifat and E. A. Butcher, New Mexico State University, Las Cruces, NM
Wednesday, May 26
1230-1400 - Lunch
1400-1530 – Session 11.
Co-Chairs: T. D. Burton and K. A. Asfar

Limit cycle oscillations of the piezo-electromagnetic structure for broad-band energy harvesting
M. A. Karami and D. J. Inman, Virginia Tech, Blacksburg, VA

Load tuning in multi-mode energy harvesting
D. D. Quinn, University of Akron, Akron, OH

Nonlinear electroelasticity and dynamics of energy harvesting beams
S. C. Stanton and B. P. Mann, Duke University, Durham, NC

On the synchronization of a controlled Duffing oscillator with a periodically forced pendulum
A. C. J. Luo and F. Min, Southern Illinois University Edwardsville, Edwardsville, IL

Turbocharger vibration shows nonlinear jump
R. G. Kirk, A. Alsaeed, and B. Mondschein, Virginia Tech, Blacksburg, VA
Index

Abed - 4
Ahmadian - 4
Al-Hazza - 6
Almutairi - 5
Alsaed - 11
AL-Shudeifat - 10
Apiwattanalunggarn - 8
Arrieta - 1
Asadi - 1
Asfar - 7
Balachandran – 4, 10
Balthazar – 7
Bauer - 5
Bergman - 4
Bobrenkov - 6
Bolgrabskaya - 3
Borre - 1
Burton - 5
Butcher – 6, 10
Carpineto - 3
Cette - 2
Chalhoub - 5
Chebanov - 3
Chielo - 7
Christoforou - 2
Compeán - 9
Dankowicz - 10
Daqaq - 6
Deines - 5
Delmavaz - 8
Demeio - 2
Dykman - 10
Ecker - 5
Elghohary - 4
Elías-Zúñiga – 6, 9, 9
Fariborz - 1
Farjoud - 4
Feeny - 3
Flashner - 1
Fuller - 3
Gabale - 9
Geist – 3, 3
Ghorashi - 9
Gilliam - 7
Haddow - 3
Hagedorn - 1
Harn - 3
Hassounch - 4
Hedrinh - 2
Hetzler - 6
Hochlenert - 7
Howcroft - 1
Hubbard - 4
Inman - 11
Jazar - 8
Jalili - 8
Kalmár-Nagy – 4, 10
Karami - 11
Kato - 9
Khaled - 5
Kirk - 11
Krauskopf – 1, 7
Kuroda - 9
Lacarbonara – 3, 10
López de Lacalle – 6, 9
Lorang - 7
Lowenberg – 1, 7
Loyer - 7
Luo - 11
Mader - 6
Mahmoodi – 4, 8
Majeed - 2
Manktelow - 8
Mann – 2, 6, 11
Martinez-Romero – 9
Maruyama - 2
McFarland - 4
Mercer -5
Miller - 10
Min - 11
Mondschein - 11
Monroe - 3
Nagai - 2
Nayfeh - 7
Neild - 1
Nguyen - 4
Olvera – 6, 9
Onozato - 2
Ouakad - 10
Perkins - 10
Petermeier - 5
Quinn - 11
Rega - 1
Rodriguez – 6, 9
Ruzzene - 8
Saetta - 1
Satkoski - 6
Schmidt - 6
Seemann - 5
Shaw, E. - 6
Shaw, S. – 3, 3, 10
Shcherbak - 3
Shrestha - 10
Simonović - 2
Sims - 9
Sinha - 9
Sinou - 7
Smith - 7
Sombart - 6
Someya - 9
Stanton - 11
Starosvetsky - 2
Taheri - 1
Telly - 10
Thota - 8
Trahan - 10
Tuseet - 7
Vakakis – 2, 4
Vestrioni - 3
Vidmar - 3
Vogl - 6
Wagg - 1
Wang - 4
Wehage - 4
Yabuno - 9
Yamaguchi - 2
Yigit - 2
Younis - 10
Yusoff - 9
Zohoor - 8
Zribi - 5