Colloquium n. 541
"New Advances in the Nonlinear Dynamics and Control
of Composites for Smart Engineering Design"
Senigallia, Ancona, Italy – 3-6 June 2013

Colloquium venue: La Rotonda a Mare

Instructions for authors:

Key lectures = 40 minutes, including discussion
Regular presentations = 20 minutes, including discussion
A PC with PowerPoint and Acrobat Reader will be available
You are allowed to use your personal laptop
If you need special tools for your presentation please inform the organization in advance

You are kindly invited to check in advance your presentation in order to overcome technical problems

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Sunday 2 June 2013

19.00 Get together party – c/o Lab 52 (50 meters from the Colloquium venue)

Monday 3 June 2013

8.00 Registration

9.30-9.50 Welcome

- Stefano Lenci – Euromech Colloquium Chairman
- Maurizio Mangialardi – Major of the City of Senigallia
- Marco Pacetti – Rector of the Polytechnic University of Marche
- Giovanni Latini – Former Dean of the Faculty of Engineering, Polytechnic University of Marche
- Dario Amodio – Dean of the Faculty of Engineering, Polytechnic University of Marche
- Eric Deletombe – Onera, France – presentation of the European Project E-CAero

9.50-10.30 Key Lecture – Chairman: Jerzy Warminski

- Holm Altenbach and Victor Eremeyev, Analysis of Vibrations of FGM Plates Using the Direct Approach

10.30-11.00 Coffee break

11.00-12.40

Session "Impacts and friction" – Chairman: José Manoel Balthazar

- Igor Andrianov and Alexey Porubov, Nonlinear dynamics of strains in composites under impact loading
- Mirosław Bocian, Krzysztof Jamroziak and Maciej Kulisiewicz, An identification of nonlinear dissipative properties of constructional materials at dynamical impact loads conditions
- Ivelin Ivanov and Tomasz Sadowski, Response of Laminated Glass to Low-Velocity Impact
- Enrico Babilio, Dynamics of an axially graded beam on elastic foundation
- Andrzej Stefanski, Synchronous properties of friction

12.40-14.40 Lunch – c/o Hotel City (200 meters from the Colloquium Venue)

14.40-16.20

Session "Continuum mechanics" – Chairman: Stefano Mariani

- Tomasz Sadowski, Mechanical response of two-phase ceramic matrix composites under compression
- Heiko Herrmann, Marika Eik, Viktoria Berg and Jari Puttonen, Phenomenological and numerical constitutive modelling of short fibre reinforced materials and control of fibre orientation distributions
- Eduardo Saetta and Giuseppe Rega, Continuous modeling and minimal dimension reduction for the nonlinear dynamics of thermoelastic laminated plates
- M. Arif Hasan, S. Cho, K. Remick, Alexander Vakakis, D.M. McFarland and W.M. Kriven, Nonlinear Acoustics of Highly Discontinuous and Adaptive Metamaterials with Embedded Granular Microstructure
- Tamara Nestorovic, Somu Shabadi, Dragan Marinkovic and Miroslav Trajkov, Modelling of piezoelectric smart structures by implementation of a user defined shell type finite element

16.20-16.50 Coffee break

16.50-18.30

Session "Theoretical developments" – Chairman: Igor Andrianov

- Kirill Vorotnikov and Yuli Starosvetsky, Nonlinear response regimes of granular chains containing internal degrees of freedom
- Eyal Buks, Forced and self-excited oscillations of an optomechanical cavity
- Michele Serpilli, Françoise Krasucki and Giuseppe Geymonat, An asymptotic strain gradient Reissner-Mindlin plate model
- Bennamia Ismail and Badereddine Aimadeddine, Modal Analysis of a Model of Light Aircraft in Composite Beams
- Giovanni Lancioni, Non-linear behaviour of materials characterized by non-convex cohesive energies

Tuesday 4 June 2013

8.00 Registration

8.30-9.10 Key Lecture – Chairman: Mohammad Younis

- Claude-Henri Lamarque, Alireza Ture Savadkoohi and Michael Naudan, Vibratory energy exchange between Bouc-Wen type and nonlinear oscillators considering two special cases

9.10-10.50

Session "Dynamical systems" – Chairman: M. Hajj

- Viktor Avrutin, Laura Gardini and Irina Sushko, Codimension-2 border collision bifurcations in Lorenz maps
- Ichiro Ario, Multiple Duffing Oscillation in a Folding Structure with Hill-top Bifurcation
- Rafal Rusinek, Krzysztof Kecik, Andrzej Weremczuk and Jerzy Warminski, Dynamics of Ueda's oscillator with time delay
- Jiri Naprstek and Cyril Fischer, Limit cycle stability of multi-degree of freedom dynamic non-linear systems
- Laura Ruzziconi, Mohammad Younis and Stefano Lenci, Dynamical integrity for predicting the response in a MEMS device

10.50-11.20 Coffee break

11.20-12.40

Session "Energy transfer and vibration absorber" – Chairman: Angelo Luongo

- Thibaut Detroux, Luc Masset, Regis Viguie and Gaetan Kerschen, Performance and Robustness of the Nonlinear Tuned Vibration Absorber
- Itay Grinberg and Oleg Gendelman, Boundary for Complete Set of Attractors for Damped-Forced Essentially Nonlinear Systems
- Alexander Shaw, Simon Neild and David Wagg, Analysis of the Motion Transmission of a Passive Vibration Isolator Incorporating a Nonlinear Spring
- Ludovic Renson and Gaetan Kerschen, A new computational method for nonlinear normal modes of nonconservative systems

12.40-14.40 Lunch – c/o Hotel City (200 meters from the Colloquium venue)

14.40-16.20

Session "Beams and laminates 1" – Chairman: Tomasz Sadowski

- Angelo Luongo and Daniele Zulli, A nonlinear 1-dimensional model of layered cross-deformable tubular beams
- Jaroslaw Latalski, Fotios Georgiades and Jerzy Warminski, Analysis of coupled vibrations of a nonlinear composite rotating beam
- Igor Andrianov, Vladislav Danishevs'kyy and Dieter Weichert, Numerical Study of Solitary Strain Waves in a Nonlinear Elastic Layered Composite Material
- Stefano Mariani, Matteo Bruggi, Francesco Caimmi, Paolo Bendiscioli and Marco De Fazio, Surface-mounted SHM system for composite structures, featuring MEMS sensors and flexible PCBs
- Stefano Lenci and Francesco Clementi, Free vibration analyses of two-layer beam with shear deformability

16.20-16.50 Coffee break

16.50-18.10

Session "Beams and laminates 2" – Chairman: Stefano Lenci

- Marco Amabili, Nonlinear Vibrations of Angle-Ply Laminated Circular Cylindrical Shells: Skewed Modes
- Sebastian Machado and Martín Saravia, Nonlinear dynamic response of a rotating composite beam
- Marco Amabili, A New Nonlinear Higher-Order Shear Deformation Theory with Thickness Variation for Large-Amplitude Vibrations of Laminated Doubly Curved Shells
- Sławomir Żółkiewski, Fundamental model of variable geometry beamlike systems in motion

Wednesday 5 June 2013

8.00 Registration

8.30-9.10 Key Lecture – Chairman: Giuseppe Rega

- Ekaterina Pavlovskaia, Marian Wiercigroch and James Ing, Grazing Induced Bifurcations

9.10-10.50
Session "Beams and laminates 3" – Chairman: Gaetan Kerschen

- Justin Murin, Mehdi Aminbaghai, Juraj Hrabovsky and Vladimir Kutis, Torsional free vibration of FGM beams
- Eulher Carvalho, Paulo Gonçalves, Zenón Del Prado and Giuseppe Rega, Nonlinear Nonplanar Vibration of a Functionally Graded Box Beam
- Pedro Ribeiro, Hamed Akhavan and Jerzy Warminski, Frequency response of variable stiffness composite laminated plates in the non-linear regime: shooting with modes
- Emil Manoach, Anna Warminska and Jerzy Warminski, Large Amplitude Vibrations of Timoshenko Beams with Delamination in Thermal Environment
- Evgeny V. Lomakin, Ivan V. Sergeichev and Fedor K. Antonov, Numerical assessment of residual strength of composite structures subjected to low-velocity impact on the base of through-hole approximation

10.50-11.20 Coffee break

11.20-13.00
Session "Pendula and bridges" – Chairman: Ichiro Ario

- Krzysztof Kecik, Andrzej Mitura and Jerzy Warminski, Non-linear Dynamics and Magnetorheological Control of a Pendulum System
- Daniil Yurchenko, Arvid Naess and Panagiotis Alevras, Stochastic Dynamics of Two Interacting Pendulums Mounted on a Heaving Platform
- Jose Sartorelli, B. Marin, F.A.C. Pereira, E. Colli and W. Lacarbonara, Dynamics of a double pendulum with non-vertical parametric excitation
- Andrea Arena, Walter Lacarbonara and Pier Marzocca, Bifurcation behavior in long-span suspension bridges subject to flutter
- Sami Davtalab, Ko-Choong Woo, Cosmas Pagwiwoko and Stefano Lenci, Nonlinear vibrations of an experimental bridge

13.00-15.00 Lunch – c/o Hotel City (200 meters from the Colloquium venue)

15.00 Bus leaving (at the Colloquium venue) for the social tour and social dinner

16.00-18.30 Visit to the famous Frasassi caves and to the Romanic church of Genga (including visit to the small archaeological museum) http://www.frasassi.com/

19.00 Social dinner at the Restaurant "Da Maria", PieroSara, Genga (An)

21.00 Bus leaving for Senigallia

Thursday 6 June 2013

8.00 Registration

8.30-9.10 Key Lecture – Chairman Paulo Gonçalves

- Oded Gottlieb, Giuseppe Habib, Emanuel Fainshtein and Kai Wolf, Model-based estimation of nonlinear material properties governing the dynamics and orbital stability of piezoelectric microcantilever sensors

9.10-10.50

Session "Structural health monitoring and energy harvesting" – Chairman: Pedro Ribeiro

- Daniela Isidori, Francesco Clementi, Leonardo Soria and Stefano Lenci, Structural Health Monitoring of smart structures: Finite Element Model updating by using preliminary test data
- A. Abdelkefi, N. Barsallo, M. Hajj, L. Tang and Y. Yang, Global Nonlinear Dynamics of Low-Frequency Ultra-Width Piezoelectric Energy Harvesters
- Marek Borowiec, Grzegorz Litak and Stefano Lenci, Noise effected energy harvesting in a beam with stopper
- Miroslav Trajkov and Tamara Nestorovic, Norm-based optimization of actuator and sensor placement for vibration control of piezoelectric composite structures
- Pierpaolo Belardinelli, Stefano Lenci and Lucio Demeio, A comparison of different semi-analytical techniques to determine the nonlinear oscillations of a slender microbeam

10.50-11.20 Coffee break

11.20-13.00

Session "Control 1" – Chairman: Jiri Naprstek

- Jerzy Warminski, Andrzej Mitura and Marcin Bochenski, A nonlinear saturation controller for a self-excited composite beam driven by harmonic force
- H. Mercier des Rochettes, D. Joly, L. Buchaniek, P. Leconte and Eric Deletombe, A New Concept of Composite Active Twist Blade to Improve Helicopter Main Rotor Dynamics
- Alois Steindl , Optimal control of the deployment and retrieval of a tethered satellite under small disturbances
- José Manoel Balthazar, D. G. Bassinello, A. M. Tusset, A. M. Bueno and B. R. de Pontes Junior, Nonlinear control in an electromechanical transducer with chaotic behaviour
- Sara Casciati , Model order reduction approach for the control of nonlinear systems

13.00-15.00 Lunch – c/o Hotel City (200 meters from the Colloquium venue)

15.00-16.40

Session "Control 2" – Chairman: Alois Steindl

- Danuta Sado and Marek Pietrzakowski, Vibration control of autoparametric system using MR dampers in the pendula joins
- Maria Neto, Jorge Ambrósio, Luis Roseiro and Ana Amaro, Active Vibration Control of a SAR Antenna
- Andrzej Mitura and Jerzy Warminski, Active Positive Position Feedback Control for Composite Flexible Structures
- Jian Peng, Yueyu Zhao, Jianjun Ma, Lianhua Wang, Xianzhong Xie, Effect of time delay on controlled stay-cable with MR fluid damper
- Narasimha Rao Mekala and Rüdiger Schmidt, Modelling and Simulation of Nonlinear Vibrations and Control of Smart Composite Structures

16.40 Colloquium closing