



International Conference on Structural Nonlinear Dynamics and Diagnosis

April 29 - May 02
Marrakech, 2012



Detailed Technical Program

Sunday, April 29

14:00-24:00 Registration at Albatros Garden Hotel

Monday, April 30

8:00-9:00 Registration at Albatros Garden Hotel

9:00-9:30 Opening

Mohamed Belhaq, Chairman of the CSNDD'2012, Hassan II-Casablanca University, Morocco.

Raouf Ibrahim, Co-Chairman of the CSNDD'2012, Wayne State University, USA.

Ali H. Nayfeh, Honorary Chairman of the CSNDD'2012, Virginia Tech, USA.

9:30-10:15 Plenary Lecture

Room: Atlas

Chairman: **S.F. Masri**

Ali H. Nayfeh, Virginia Tech, USA.

Renewable Energy in Developing Countries.

10:15-10:45 Welcome Reception

10:45-12:15 Invited Lectures

Room: Atlas

Chairman: **W. Arnold**

- **10:45-11:15 Chuck Farrar**, Los Alamos Laboratory, USA
Applications of Nonlinear Dynamics in Structural Health Monitoring.
- **11:15-11:45 Eckehard Schöll**, TU Berlin, Germany
Adaptive Time-Delayed Feedback Control of Complex Networks.
- **11:45-12:15 Joseph A. Turner**, University of Nebraska-Lincoln, USA
Recent Results on Diffuse Scattering in Materials under Applied Loads.

12:30-14:00 Lunch at Albatros Garden

14:10-16:30 Parallel Sessions

Parallel Sessions : Monday, April 30, 14:10-16:30			
	MS1 Chairmen: M.N. Ichchou C. Farrar Room Toubkal	MS2 Chairmen: B. Fiedler E. Schöll Room Asni	MS3 Chairmen: A. Kareem M.R. Hajj Room Oukaïmeden
14:10-14:30	R. Ibrahim Distributed dynamic effects in composite T-joints due to localized damages	V. Flunkert Chaos and synchronization in delayed system: Applications to laser networks	M.R. Hajj Experimental identification of concentrated nonlinearity in aeroelastic system
14:30-14:50	A. Deraemeker Monitoring of the ultrasonic <i>P</i> -wave velocity in early-age concrete using smart aggregates	S.V. Gurevich Destabilization of localized structures in reaction-diffusion systems induced by delayed feedback	K. Ahlin Time history forced response in nonlinear mechanical systems

Parallel Sessions : Monday, April 30, 14:10-16:30			
	MS1 Chairmen: M.N. Ichchou C. Farrar Room Toubkal	MS2 Chairmen: B. Fiedler E. Schöll Room Asni	MS3 Chairmen: A. Kareem M.R. Hajj Room Oukaïmeden
14:50-15:10	B. Carboni On the reliability of a PCA-based method for structural diagnosis in bridge structures with environmental disturbances	M.I. Younis The Effect of time-delay feedback controller on an electrically actuated resonator	N. Yagiz Analysis of passenger ride comfort
15:10-15:30	M.N. Ichchou Pipes inspection by torsional guided-waves generator, numerical and experimental analysis	A. Panchuk Delay FitzHugh-Nagumo equations for modelling coupled neurons	A. Kareem Modelling of nonlinear bridge aerodynamics and aeroelasticity: a convolution based approach
15:30-15:50	C.R. Farrar On assessing the robustness of an input signal optimization algorithm for damage detection: the info-gap decision theory approach	A. Kaddar Global analysis for a delay-distributed SIR epidemic model	S.F. Masri Use of stochastic optimization techniques for damage detection in complex nonlinear systems
15:50-16:10	M. Bendame Nonlinear modeling and analysis of a vertical springless energy harvester	A. Bichri Effect of time delay on vibroimpact dynamics in a forced Hertzian contact oscillator	T. Ikeda Nonlinear responses of sloshing in square tanks subjected to horizontal random ground excitation
16:10-16:30	W. Batko Uncertainty analysis in the noise parameters estimation	R. Yafia Qualitative properties in a more general delayed hematopoietic stem cells mode	J. Perret-Liaudet Intermittency in the case of a bouncing ball dynamic system induced by a Gaussian random restitution coefficient

16:30-17:00 Coffee Break and Poster Session

17:00-19:20 Parallel Sessions

Parallel Sessions : Monday, April 30, 17:00-19:20			
	MS4 Chairmen: E.S. Titi A. Azouani Room Toubkal	MS5 Chairmen: M.I. Younis F. Najjar Room Asni	MS6 Chairmen: D. Zulli C. H. Lamarque Room Oukaïmeden
17:00-17:20	A. Azouani Feedback control of nonlinear dissipative systems – a reaction diffusion paradigm	W. Arnold Subsurface imaging using atomic force acoustic microscopy at GHz frequencies	D. Zulli Aeroelastic instability analysis of NES-controlled systems via a mixed multiple scale/harmonic balance algorithm
17:20-17:40	G. Schimperna On a class of nonisothermal models for nematic liquid crystals	J.A. Turner Influence of tip-sample contact on vibration ring down of AFM cantilevers	E. Gourc Delayed dynamical system strongly coupled to a nonlinear energy sink : application to machining chatter

Parallel Sessions : Monday, April 30, 17:00-19:20			
	MS4 Chairmen: E.S. Titi A. Azouani Room Toubkal	MS5 Chairmen: M.I. Younis F. Najar Room Asni	MS6 Chairmen: A. Luongo C.H. Lamarque Room Oukaimeden
17:40-18:00	D. Catania Existence and convergence of an MHD approximate deconvolution model	F. Lakrad Effects of a high-frequency harmonic voltage on the dynamic of MEMS and its basin of attraction	S. Bellizzi Analysis of a passive control of a chain under wide-band random excitation by nonlinear energy sinks using generalized orthogonal decompositions
18:00-18:20	H. Zaag All about blow-up for a semilinear wave equation in one space dimension	F. Najar Nonlinear dynamical analysis of an AFM tapping mode microcantilever beam	V.N. Pilipchuk Energy partition oscillator and necessary and sufficient conditions of energy localization
18:20-18:40	M. Jolly On single mode forcing of the 2D Navier-Stokes equations	I. Kirrou Frequency shift analysis and hysteresis suppression in contact-mode AFM using contact stiffness modulation	C.H. Lamarque Dynamics of a forced 2 dof piece-wise linear system by consideration of the weight
18:40-19:00	W. Varnhorn On optimal initial value conditions for local strong solutions of the Navier-Stokes equations	S. Lenci Dynamics of a MEMS subject to thermoelastic and squeeze-film damping	J.W. Shao Passive control of resonances by nonlinear absorbers
19:00-19:20			G. Kerschen The nonlinear tuned vibration absorber

Tuesday, May 1

9:00-9:45 Plenary Lecture Room: Atlas Chairman: **B. Fiedler**

Edriss S. Titi, University of California, Irvine, USA
Navier-Stokes, Euler, and Other Relevant Equations

9:45-10:15 Invited Lecture Room: Atlas Chairman: **A.H. Nayfeh**

Bernold Fiedler, Free University of Berlin, Germany
How Delayed Control Can Stabilize Delay Equations

10:15-10:45 Coffee Break

10:45-12:15 Invited Lectures Room: Atlas Chairmen: **R.H. Rand**

- 10:45-11:15 Jan Awrejcewicz**, Technical University of Lodz, Poland
On the Novel 3D Friction Model and Wobblestone Dynamics: Theory, Simulation and Experimental Results
- 11:15-11:45 Sami F. Masri**, University of Southern California, USA
Some Approaches for the Detection, Location, and Quantification of Changes in Nonlinear Structural Systems
- 11:45-12:15 Vladimir Babitsky**, Loughborough University, UK

On Analysis of Vibro-impact Response of the Cracked Structures for non Destructive Health Monitoring

12:30-14:00 Lunch at Albatros Garden

14:10-16:10 Parallel Sessions

Parallel Sessions : Tuesday, May 1, 14:10-16:10				
	MS7 Chairmen: S. Saravanan M. Hasnaoui Room Toubkal	MS8 Chairmen M. Aziz Alaoui C. Bertelle Room Asni	MS9 Chairmen J. Awrejcewicz P. Hagedorn Room Oukaimeden	MS4 Chairmen E.S. Titi Room Atlas
14:10-14:30	S. Saravanan Nonlinear stability of a convective flow in an inclined channel	C. Letellier Relation between synchronization of a ring of coupled Rössler systems and observability	O. Alber Bifurcation of contact between rotor and stator	A. Mazzucato Boundary layer analysis for certain classes of non-linear incompressible flows
14:30-14:50	B.S. Bhadauria Weak non-linear thermal instability under temperature modulation	B. Ambrosio Synchronization and control of coupled reaction-diffusion systems of FitzHugh-Nagumo type	J. Awrejcewicz Analysis of regular and chaotic dynamics of multi-layered Timoshenko-type beams using wavelets	N. Popovic A geometric classification of traveling front propagation in the Nagumo equation with cut-off
14:50-15:10	J. Bouchgl Effect of horizontal vibration on the interfacial instability in a horizontal Hele-Shaw cell	M. Aziz Alaoui Complex networks dynamics	G. Spelsberg-Korspeter Analysis of technical systems using Carleman linearization	J. Mathew Long wave length soliton solutions of nonlinear differential equations
15:10-15:30	M. Hasnaoui Hydromagnetic and Soret driving free convection in an inclined porous cavity saturated by a conducting binary mixture	M. Boutayeb Observers based digital synchronization for one sided Lipschitz non linear systems	J.M. Balthazar Using of snap-through truss absorber in te attenuation of the sommerfield effect	T. Hmidi About isentropic Euler equations with critical regularities
15:30-15:50	K. Allali Influence of the modulation of vibration amplitude on convective instability of reaction fronts in porous media	V. Lanza On the importance of memristor dynamics for synchronization behavior of two Hr neurons	D. Hochlenert Bifurcation analysis of nonlinear systems with periodic coefficients	P. Markowich On nonlinear dispersive equations in periodic structures: semiclassical limits and numerical schemes
15:50-16:10	S. Saravanan Onset of vibrational convection in a binary fluid saturated non-Darcy porous layer heated from above	C. Bertelle Topology identification and cluster synchronization in complex dynamical networks	J. M. Balthazar On control strategies to an energy harvester using of a non-ideal and chaotic vibrating system like device	

16:10-16:40 Coffee Break and Poster Session

16:40-19:00 Parallel session

Parallel Sessions : Tuesday, May 1, 16:40-19:00			
	MS10 Chairmen: K.W. Chung F. Lakrad Room Toubkal	MS11 Chairmen: J.M. Balthazar L. Azrar Room Asni	MS12 Chairmen: R. Benamar S. Glavatskih Room Oukaimeden
16:40-17:00	L. Cveticanin Asymptotic method for truly nonlinear oscillator with time variable parameter	M. R Hajj Uncertainty quantification of piezoelectric energy harvesters from aeroelastic vibrations	A. Zougari Vibration response of a railway track obtained using numerical models based on FEM
17:00-17:20	A. Kareem Synthesis of multi-input Volterra systems by a topological assemblage scheme	P. Berik Quasi-static and static experimentations and their 3D finite element simulations of a piezoceramic d15 shear – induced direct torsion actuator	Y. Gerges A reduced order model for nonlinear vibroacoustic problems
17:20-17:40	I. Kovacic On the influence of the powers of a restoring and damping force on the response of a generalized van der Pol oscillator	T. Loukil Global semi-active vibration control with energy reinjection: application to a piezostack-based mount	K. El Bikri Large amplitude free vibration analysis of functionally graded beams using an homogenization procedure
17:40-18:00	C. Heckman Center manifold reduction of the Hopf-Hopf bifurcation a time delay system	L. Azrar Multi-coated magnetoelastoelectroelastic composites with functionally graded interphases	R. Benamar The effects of large vibration amplitudes on the mode shapes and natural frequencies of thin isotropic skew plates
18:00-18:20	K. W. Chung A novel construction of homoclinic and heteroclinic orbits in nonlinear oscillators and a two-dimensional complex Ginzburg-Landau equation by a perturbation incremental method	M.R. Hajj Camber Effects on the Power Harvesting from Piezoaeroelastic Systems	S. Glavatskih Nonlinear dynamic response of compliant journal bearings
18:20-18:40	A. Fahsi Analytics of heteroclinic bifurcation near a 4:1 subharmonic resonance	E.H. Koroishi Fuzzy control of rotor system using an electromagnetic actuator	N. Machkour Experimental validation of a new magnetic method applied to diagnose a low voltage breaker arc
18:40-19:00	S.M. Sah Dynamics of a rocking horizontal pendulum under high frequency excitation	L. Azrar Dynamic instability analysis of single walled carbon nanotubes conveying fluid under generalized boundary conditions	A. Khamlichi Liquefaction of Tangier soils by using physically based reliability analysis modeling

21:00 Conference Dinner

Wednesday, May 2

9:00-9:45 Plenary Lecture

Room: Atlas

Chairman: R. Ibrahim

Richard Rand, Cornell University, USA

Parametric Excitation and Evolutionary Dynamics

9:45-10:15 Coffee Break

10:15-12:45 Parallel Sessions

Parallel Sessions : Wednesday, May 2, 10:15-12:15			
	MS4 Chairman: E. Titi Room Toubkal	MS5 Chairmen: J.A. Turner S. Lenci Room Asni	MS13 Chairmen: J. Starke P. Szmolyan Room Oukaimeden
10:15-10:35	A. Morando Nonlinear a priori estimates for 3D incompressible current-vortex sheets	M.I. Younis Modeling and design of an electrically actuated resonant switch	P. Szmolyan Geometric singular perturbation theory beyond the standard form
10:35-10:55	L. Moutaouekkil Existence of periodic solution for P-Laplacian neutral rayleigh equation with sign-variable coefficient of non linear term	L. Ruzziconi Theoretical and experimental investigation of the nonlinear response of an electrically actuated imperfect microbeam	J. Starke Continuation and bifurcation analysis in mechanical experiments
10:55-11:15	P. Korn Numerical ocean modelling: on structure-preserving discretizations and computational turbulence models	V. Settini Bifurcations, basin erosion and dynamic integrity in a single-mode model of noncontact atomic force microscopy	S. Alonso Wave propagation in excitable media through randomly distributed heterogeneities: simulations and comparison to the effective medium theory
11:15-11:35	M.V. Bartucelli Sharp constants in the Sobolev embedding theorem for the L^∞ -norm on the torus in one, two and three space dimensions	N. Kacem Nonlinear dynamics of nanoelectromechanical cantilevers based on nanowire piezoresistive detection	A. El Aroudi A Closed form expression for predicting fast scale instability in switching buck converters
11:35-11:55	P. Secchi Stability of the plasma-vacuum interface problem		H. Benner Control and synchronisation of chaotic oscillators with time-delayed couplings
11:55-12:15			P.G. Hjorth Analysis of oscillations in pedestrian crowds

12:30-13:00 Closure

13:00-14:30 Lunch at Albatros Garden