

Contents

Invited Speakers

Construction of a Chaotic Computer Chip	3
William L. Ditto, K. Murali and Sudeshna Sinha	
Activated Switching in a Parametrically Driven Micromechanical Torsional Oscillator	15
H.B. Chan and C. Stambaugh	
Quantum Nanomechanics	25
Pritiraj Mohanty	
Coupled-Core Fluxgate Magnetometer	37
Andy Kho, Visarath In, Adi Bulsara, Patrick Longhini, Antonio Palacios, Salvatore Baglio and Bruno Ando	
Data Assimilation in the Detection of Vortices	47
Andrea Barreiro, Shanshan Liu, N. Sri Namachchivaya, Peter W. Sauer and Richard B. Sowers	
The Role of Receptor Occupancy Noise in Eukaryotic Chemotaxis	61
Wouter-Jan Rappel and Herbert Levine	
Applications of Forbidden Interval Theorems in Stochastic Resonance ...	71
Bart Kosko, Ian Lee, Sanya Mitaim, Ashok Patel and Mark M. Wilde	
Smart Materials and Nonlinear Dynamics for Innovative Transducers ...	91
B. Andò, A. Ascia, S. Baglio, N. Pitrone, N. Savalli, C. Trigona, A.R. Bulsara and V. In	
Dynamics in Non-Uniform Coupled SQUIDs	111
Patrick Longhini, Anna Leese de Escobar, Fernando Escobar, Visarath In, Adi Bulsara and Joseph Neff	

Applications of Nonlinear and Reconfigurable Electronic Circuits	119
Joseph Neff, Visarath In, Christopher Obra and Antonio Palacios	
Multi-Phase Synchronization and Parallel Power Converters	133
Toshimichi Saito, Yuki Ishikawa and Yasuhide Ishige	
Coupled Nonlinear Oscillator Array (CNOA) Technology – Theory and Design	145
Ted Heath, Robert R. Kerr and Glenn D. Hopkins	
Nonlinear Dynamic Effects of Adaptive Filters in Narrowband Interference-Dominated Environments	163
A.A. (Louis) Beex and Takeshi Ikuma	
Design-Oriented Bifurcation Analysis of Power Electronics Systems	175
Chi K. Tse	
Collective Phenomena in Complex Social Networks	189
Federico Vazquez, Juan Carlos González-Avella, Víctor M. Eguíluz and Maxi San Miguel	
Enhancement of Signal Response in Complex Networks Induced by Topology and Noise	201
Juan A. Acebrón, Sergi Lozano and Alex Arenas	
Critical Infrastructures, Scale-Free Networks, and the Hierarchical Cascade of Generalized Epidemics	211
Markus Loecher and Jim Kadtk	
Noisy Nonlinear Detectors	225
A. Dari and L. Gammaitoni	
Cochlear Implant Coding with Stochastic Beamforming and Suprathreshold Stochastic Resonance	237
Nigel G. Stocks, Boris Shulgin, Stephen D. Holmes, Alexander Nikitin and Robert P. Morse	
Applying Stochastic Signal Quantization Theory to the Robust Digitization of Noisy Analog Signals	249
Mark D. McDonnell	
Resonance Curves of Multidimensional Chaotic Systems	263
Glenn Foster, Alfred W. Hübler and Karin Dahmen	
Learning of Digital Spiking Neuron and its Application Potentials	273
Hiroyuki Torikai	
Dynamics in Manipulation and Actuation of Nano-Particles	287
Takashi Hikihara	

Nonlinear Buckling Instabilities of Free-Standing Mesoscopic Beams	297
S.M. Carr, W.E. Lawrence and M.N. Wybourne	
Developments in Parrondo's Paradox	307
Derek Abbott	
Magnetophysiology of Brain Slices Using an HTS SQUID Magnetometer System	323
Per Magnelind, Dag Winkler, Eric Hanse and Edward Tarte	
Dynamical Hysteresis Neural Networks for Graph Coloring Problem	331
Kenya Jin'no	
Semiconductor Laser Dynamics for Novel Applications	341
Jia-Ming Liu	
Nonlinear Prediction Intervals by the Bootstrap Resampling	355
Tohru Ikeguchi	
Quantum Measurements with Dynamically Bistable Systems	367
M.I. Dykman	
 Poster Session	
Dynamics and Noise in dc-SQUID Magnetometer Arrays	381
John L. Aven, Antonio Palacios, Patrick Longhini, Visarath In and Adi Bulsara	
Stochastically Forced Nonlinear Oscillations: Sensitivity, Bifurcations and Control	387
Irina Bashkirtseva	
Simultaneous, Multi-Frequency, Multi-Beam Antennas Employing Synchronous Oscillator Arrays	395
J. Cothern, T. Heath, G. Hopkins, R. Kerr, D. Lie, J. Lopez and B. Meadows	
Effects of Nonhomogeneities in Coupled, Overdamped, Bistable Systems .	403
M. Hernandez, V. In, P. Longhini, A. Palacios, A. Bulsara and A. Kho	
A New Diversification Method to Solve Vehicle Routing Problems Using Chaotic Dynamics	409
Takashi Hoshino, Takayuki Kimura and Tohru Ikeguchi	
Self-Organized Neural Network Structure Depending on the STDP Learning Rules	413
Hideyuki Kato, Takayuki Kimura and Tohru Ikeguchi	

Communication in the Computer Networks with Chaotic Neurodynamicis	417
Takayuki Kimura and Tohru Ikeguchi	
Nonlinear DDE Analysis of Repetitive Hand Movements in Parkinson's Disease.....	421
Claudia Lainscsek, Luis Schettino, Peter Rowat, Elke van Erp, David Song and Howard Poizner	
Experimental Results of Coupled E-Field Sensor	427
Norman Liu	
Chaos Generators for Noise Radar	433
K.A. Lukin, V. Kulyk and O.V. Zemlyaniy	
Resonance Induced by Repulsive Links	439
Teresa Vaz Martins and Raúl Toral	
Time Scales of Performance Levels During Training of Complex Motor Tasks	445
Gottfried Mayer-Kress, Yeou-Teh Liu and Karl M. Newell	
Analysis of Nonlinear Bistable Circuits	449
Suketu Naik	
Noise-Induced Transitions for Limit Cycles of Nonlinear Systems	455
Lev Ryashko	
Torus Bifurcation in Uni-Directional Coupled Gyroscopes	463
Huy Vu, Antonio Palacios, Visarath In, Adi Bulsara, Joseph Neff and Andy Kho	
Index	469