



9TH EUROPEAN NONLINEAR DYNAMICS CONFERENCE

25-30 June, 2017

Budapest, Hungary

Department of Applied Mechanics
Budapest University of Technology
and Economics

PROGRAMME

www.congressline.hu/enoc2017

ORGANIZERS

Local Organizing Committee (LOC)

Gábor Stépán (*chairman*)

Gábor Csernák (*secretary*)

Péter Beda

Gábor Domokos

Zsolt Gáspár

János Józsa

György Károlyi

Gyula Patkó

Tamás Tél

János Vad

European Nonlinear Oscillations Conference Committee (ENOCC)

Giuseppe Rega, Italy (*Chair ENOCC*)

Vincent Acary, France

Matthew Cartmell, UK

Felix Chernousko, Russia

Oded Gottlieb, Israel

Andrei Metrikine, The Netherlands

Remco Ingmar Leine, Germany

Pedro Leal Ribeiro, Portugal

Alois Steindl, Austria

Gábor Stépán, Hungary

WELCOME

Dear Colleagues,

It is my great pleasure and privilege to welcome you at the 9th European Nonlinear Dynamics Conference (ENOC 2017) in Budapest, Hungary.

I would like to express my gratitude to the European Nonlinear Oscillations Conference Committee and Council for supporting our proposal. My colleagues in the Local Organizing Committee did their best to create a friendly atmosphere for work and rest, encourage new personal contacts and exchange of ideas.

Budapest is an ideal setting to discuss current progress in the research of nonlinear dynamics. Our capital is a city of outstanding geographical location with great traditions, wonderful historical places, as well as plenty of prestigious hotels within walking distance to the venue and to downtown Budapest.

According to the traditions of ENOC conferences, the scientific programme is structured to numerous minisymposia on major and challenging pre-defined topics, organized by well-recognized scientists.

I wish you all a successful meeting, full of exchange and improvement of ideas and knowledge in the diverse fields of nonlinear dynamics.

Gábor Stépán

Chair of ENOC 2017

Department of Applied Mechanics

Budapest University of Technology and Economics

GENERAL INFORMATION

Conference date

25-30 June, 2017

Conference venue

Budapest University of Technology and Economics (BME)
H-1111 Budapest, Műegyetem rkp. 3. / Building K

Please note that the plenary room (KF51, Auditorium Maximum), session rooms, Aula and Gallery areas are on 3 different levels in the building, they are visualized on the floorplans in this programme book.

Access by public transportation

The simplest way to reach the venue of ENOC 2017 - Building K of BME - is by a short walk from the public transport interchange hub called Szent Gellért Tér (St. Gellért Square).

Trams stopping here: 19, 41, 47, 48, 49, 56, 56A

Busses stopping here: 7, 133E

Underground line No. 4 (Metro M4, green line)

Official conference language

The official language of the conference is English.

Internet access

Password secured free WIFI is available at the venue of the conference.

For access codes please contact the registration desk on-site.

Registration and information desk opening hours

25 June, Sunday 15.00- 21.00

26 June, Monday 8.00-18.00

27 June, Tuesday 8.00-18.00

28 June, Wednesday 8.00-14.00

29 June, Thursday 8.00-18.00

30 June, Friday 8.00-12.00

Hotline to registration desk

+36 70/608-6806

Meals

Included in the registration fee, organisers provide coffee breaks and hot lunches for the participants. The meals are served in the Aula and on the Gallery of the conference venue where the registration desk and the poster stands are placed.

The serving points are marked on the floorplan in this program book, the serving times are detailed in the programme overview.

Badges

Identification badges are provided along with other conference materials upon registration. The organisers kindly ask you to wear them all the time during the conference. Please also note that your conference badge assures your entrance to conference premises and catering. Persons without badges may be refused.

The identification badges are also helpful when contacting the secretariat and other participants.

Mobile phones

Please respect the speakers and presenters by ensuring that your mobile phone is switched off during the scientific sessions.

Technical Information for Speakers

The organizers kindly ask you to bring your presentations with you on a USB memory stick. Your presentation must be uploaded to the computers in the posted room with the help of the assisting volunteers responsible for the dedicated room.

The presentation uploading deadline is the last coffee break prior to your scheduled presentation. Please note that double slide projection and personal laptops cannot be used.

Technical Information for Poster Presenters

Poster size: 1189 mm vertically x 841 mm horizontally (A0 portrait size)

Poster set-up: Monday, 26 June from 9.00

Poster removal: Friday, 30 June from 11.00

All supplies needed to hang the posters will be available at the poster stands.

Poster session: **Thursday, 29 June 16.00-18.00**

Programme changes

Due to unforeseen circumstances the organisers cannot assume liability for any changes in the scientific programme. Organisers will do their best to keep ENOC 2017 participants up to date, possible changes in programme will be immediately communicated.

Conference papers of ENOC 2017 Conference

Please find all the papers under the following link:

<http://congressline.hu/enoc2017/abstracts.php>

ENOC 2017 Young Scientist Award

The Organizing Committee proudly announces the ENOC 2017 Young Scientist Award given for the best two oral presentations during the conference.

The nominated presentations will be evaluated during the sessions and awarded on the Closing Ceremony. Each winner will receive a 300 EUR prize, a special experimental device and a certificate.

ENOC 2017 Best Poster Award

The Organizing Committee proudly announces the ENOC 2017 Best Poster Award given for the best poster presentation during the conference. The best poster will be chosen during the poster session and awarded on the Closing Ceremony.

The winner will receive a special experimental device and a certificate.

REGISTRATION FEES

Registration types	Regular fees after 28 April, 2017	Onsite fees
Participant/Author registration fee EUROMECH member	EUR 550	EUR 570
Participant/Author registration fee non EUROMECH member	EUR 580	EUR 600
Student/Student Author registration fee	EUR 300	EUR 300
Additional paper handling fee	EUR 100	EUR 100
Accompanying Person participation fee	EUR 180	EUR 180

All prices include 27% VAT.

Participant / Author / Student fees include

- Access to all conference sessions
- Conference bag
- Programme booklet
- Attendance at the Ice Breaker
- Attendance at the half day excursion
- Attendance at the Farewell Dinner
- Coffee and tea during coffee breaks
- Lunches

The accompanying person fee includes

- Attendance at the Ice Breaker
- Attendance at the half day excursion
- Attendance at the Farewell Dinner
- Castle tour including visit at the National Gallery
- Budapest Bath Tour – Széchenyi Bath
- Tour bag

SOCIAL PROGRAMMES

Ice Breaker

Sunday, 25 June, 2017, 19.00-21.00

Venue: Budapest University of Technology and Economics, Building K, Aula

Included in registration fee / accompanying fee

By refreshing yourself after travelling with some wine and snacks, you can register and meet your colleagues at the conference venue.

Farewell Dinner

Thursday, 29 June, 2017, 19.00-24.00

Venue: Szekér Csárda / Budapest, Óbuda Island

Included in registration / accompanying fee

Departure: by boat at 19.00 from Gellért Square port Liberty Bridge (Szabadság híd) Buda side.

The organizers of the ENOC 2017 congress are willing to give you a little taste of the Hungarian culture spiced with a memorable boat trip on the river Danube. Make sure not to miss this unique opportunity and attend the farewell dinner! Beyond the pleasant boat ride you will get excellent Hungarian hospitality, traditional food, nice wines, lots of fun with colleagues and a temporary time travel back to the 19th century to see how Csárdás was danced in a Csárda.

Half day excursion (prior registration was needed)

Wednesday, 28 June, 2017, 13.30-18.00

Included in registration fee / accompanying fee

Departure: at 14.00 from Budapest University of Technology and Economics

Please note that for security reasons a photo ID is necessary, make sure to have it with you! During the excursions refreshments are provided.

Sightseeing tour

This half-day sightseeing tour highlights the most attractive features of the beautiful city of Budapest. Participants also visit the impressive House of Parliament.

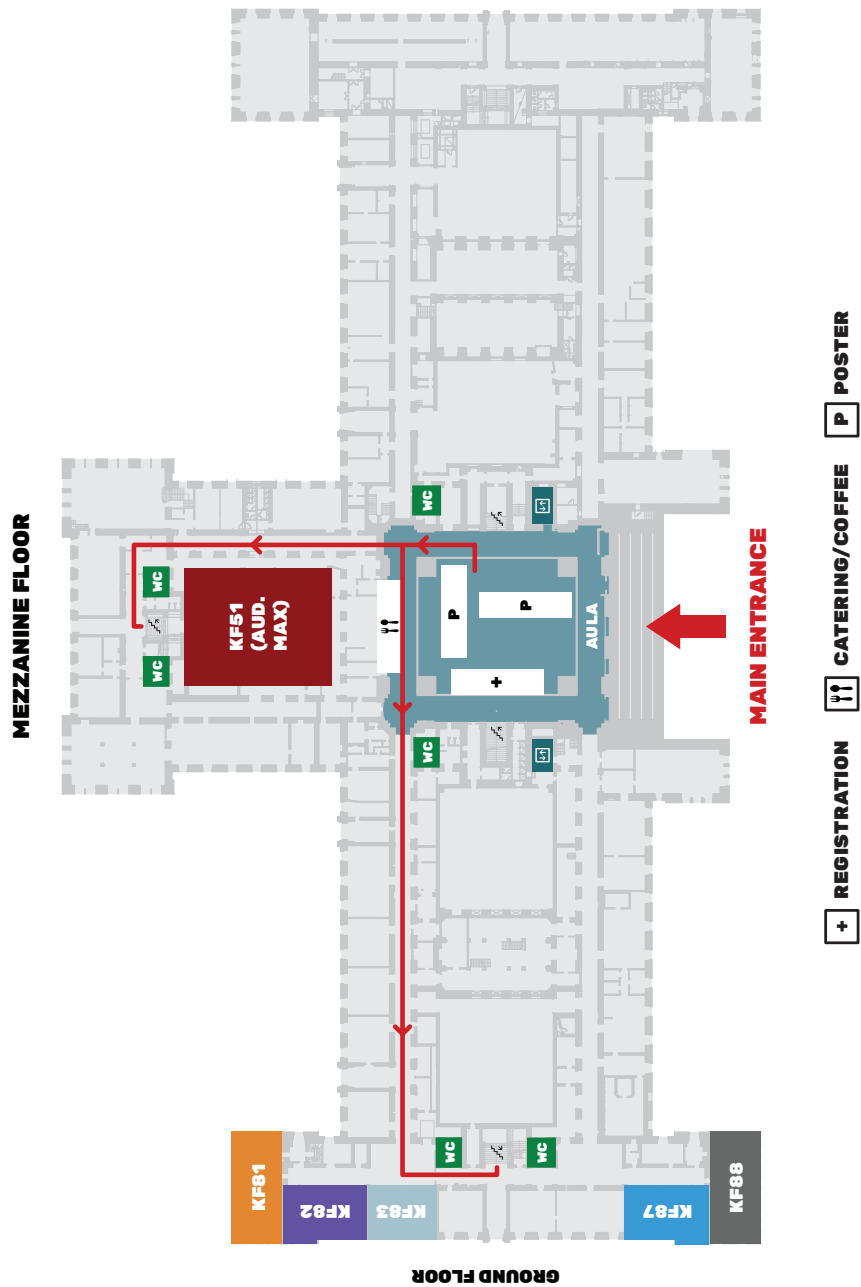
The Jewish sights of Budapest

During this four-hour long walking tour in the world's second largest Synagogue you can have an inside look into the Jewish quarter's very rich history.

Factory visit AUDI Hungary

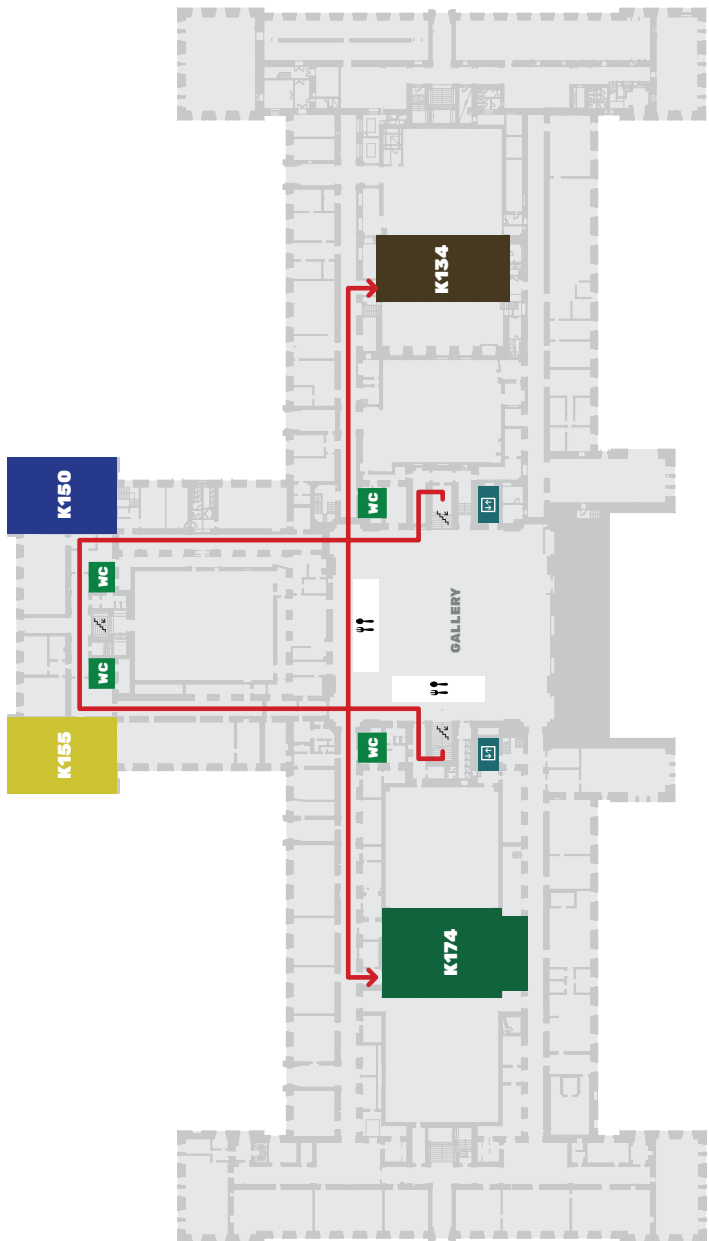
AUDI Hungary invites you to a stunning factory tour on the path. Please calculate with 1,5 hours bus transportations to the visitor centre and back.

FLOORPLANS



FLOORPLANS

FIRST FLOOR



CATERING/COFFEE

PROGRAMME OVERVIEW

Sunday, 25 June, 2017

19.00 - 21.00 ICE BREAKER – AULA, BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS

Monday, June 26, 2017

TIME/ ROOM	ROOM 1 (KF51)	ROOM 2 (K174)	ROOM 3 (K155)	ROOM 4 (K134)	ROOM 5 (K150)	ROOM 6 (KF81)	ROOM 7 (KF88)	ROOM 8 (KF82)	ROOM 9 (KF87)
09.30	Opening Ceremony								
-									
10.30	COFFEE BREAK								
-									
11.00									
-									
12.00	Plenary lecture								
-									
12.00	LUNCH								
-									
13.30									
-									
15.30									
-									
15.30	COFFEE BREAK								
-									
16.00									
-									
18.00									

Particles - Simulating Complicated Processes with Meshfree Methods
Peter Eberhard
University of Stuttgart, Germany

Tuesday, June 27, 2017

TIME/ ROOM	ROOM 1 (KF51)	ROOM 2 (K174)	ROOM 3 (K155)	ROOM 4 (K134)	ROOM 5 (K150)	ROOM 6 (KF81)	ROOM 7 (KF88)	ROOM 8 (KF82)	ROOM 9 (KF87)
09.30	MS-09 III. Nonlin. Dyn. Eng. Sys.	MS-11 III. Time delay	MS-03 III. Comput. M.	MS-08 III. Nonlin. Mech. & Struct.	MS-18 III. Control	MS-10 III. Non-smooth Dyn.	MS-07 III. Multibody	MS-02 I. Asymptotic M.	MS-01 I. Reduced- order
-									
10.30									
10.30	COFFEE BREAK								
-									
11.00									
-	Autonomous assembly of a team of flexible spacecraft								
12.00	Plenary lecture								
12.00									
-									
13.30									
13.30	MS-09 IV. Nonlin. Dyn. Eng. Sys.	MS-11 IV. Time delay	MS-03 IV. Comput. M.	MS-08 IV. Nonlin. Mech. & Struct.	MS-18 IV. Control	MS-10 IV. Non-smooth Dyn.	MS-13 I. Nonlin. Dyn. in Biol.	MS-02 II. Asymptotic M.	MS-01 II. Reduced- order
-									
15.30									
-									
16.00									
-	COFFEE BREAK								
16.00	MS-09 V. Nonlin. Dyn. Eng. Sys.	MS-11 V. Time delay	MS-03 V. Comput. M.	MS-08 V. Nonlin. Mech. & Struct.	MS-18 V. Control	MS-16 I. Random Dyn. Sys.	MS-13 II. Nonlin. Dyn. in Biol.	MS-02 III. Asymptotic M.	MS-01 III. Reduced- order
-									
18.00									

Wednesday, June 28, 2017

TIME/ ROOM	ROOM 1 (KF51)	ROOM 2 (K174)	ROOM 3 (K155)	ROOM 4 (K134)	ROOM 5 (K150)	ROOM 6 (KF81)	ROOM 7 (KF88)	ROOM 8 (KF82)	ROOM 9 (KF87)
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09.30	MS-09 VI. Nonlin. Dyn. Eng. Sys.	MS-11 VI. Time delay	MS-12 I. MEMS-NEWS	MS-08 VI. Nonlin. Mech. & Struct.	MS-04 I. Experiments	MS-16 II. Random Dyn. Sys.	MS-14 I. Nonlin. Dyn. Eng. Design		MS-20 I. Wave Propagation
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10.30
-
11.00
COFFEE BREAK

Internal resonances in tiny structures: new results and practical applications

Steven Shaw^{1,2}

¹Department of Mechanical and Aerospace Engineering, Florida Institute of Technology, Melbourne, FL, USA

²Departments of Mechanical Engineering and Physics and Astronomy, Michigan State University, East Lansing, MI, USA

11.00	Plenary lecture
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12.00
-
13.30
LUNCH

14.00
-
18.00
EXCURSION

Thursday, June 29, 2017

09.30	MS-21 I. Traffic & Vehicle	MS-12 II. MEMS-NEWS	MS-05 I. Slow-fast Sys.	MS-04 II. Experiments	MS-17 I. Time-periodic Sys.	MS-14 II. Nonlin. Dyn. Eng. Design	MS-15 I. Energy Transfer	MS-20 II. Wave Propagation
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10.30
-
11.00
COFFEE BREAK

11.00	Plenary lecture
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Tailoring nonlinearity for advanced engineering design: linearization, optimization and practical realization

Gaëtan Kerschen

Space Structures and Systems Laboratory, Aerospace and Mechanical Engineering Department, University of Liege, Belgium

Thursday, June 29, 2017

TIME/ ROOM	ROOM 1 (KF51)	ROOM 2 (K174)	ROOM 3 (K155)	ROOM 4 (K134)	ROOM 5 (K150)	ROOM 6 (KF81)	ROOM 7 (KF88)	ROOM 8 (KF82)	ROOM 9 (KF87)
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12.00
- LUNCH
13.30

13.30	-	MS-12 III. MEMS-NEMS	MS-05 II. Slow-fast Sys.	MS-04 III. Experiments	MS-17 II. Time-periodic Sys.	MS-14 III. Nonlin. Dyn. Eng. Design	MS-15 II. Energy Transfer	MS-21 II. Traffic & Vehicle
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15.30
- COFFEE BREAK
16.00

16.00
- POSTER SESSION
18.00

19.00 FAREWELL DINNER

Friday, June 30, 2017

09.30	-	MS-12 IV. MEMS-NEMS	MS-05 III. Slow-fast Sys.	MS-17 III. Time-periodic Sys.	MS-14 IV. Nonlin. Dyn. Eng. Design	MS-15 III. Energy Transfer
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10.30
- COFFEE BREAK
11.00

Exact model reduction for nonlinear oscillations: from equations to data sets
George Haller
Chair in Nonlinear Dynamics, Institute for Mechanical Systems, ETH Zürich

Plenary
lecture

Closing
ceremony

12.00
-
13.30

LIST OF MINI-SYMPOSIA

Nr.	Title	Short name
MS01	Reduced-Order Modeling and System Identification	Reduced-order
MS02	Asymptotic Methods	Asymptotic M.
MS03	Computational Methods	Comput. M.
MS04	Experiments in Nonlinear Dynamics and Control	Experiments
MS05	Slow-Fast Systems and Phenomena	Slow-fast Sys.
MS06	Fractional Derivatives	Fractional Deriv.
MS07	Dynamics and Optimization of Multibody Systems	Multibody
MS08	Nonlinear Phenomena in Mechanical and Structural Systems	Nonlin. Mech. & Struct.
MS09	Nonlinear Dynamics in Engineering Systems	Nonlin. Dyn. Eng. Sys.
MS10	Non-Smooth Dynamics	Non-smooth Dyn.
MS11	Systems with Time Delay	Time delay
MS12	Micro- and Nano-Electro-Mechanical Systems	MEMS-NEMS
MS13	Nonlinear Dynamics in Biological Systems	Nonlin. Dyn. in Biol.
MS14	Nonlinear Dynamics for Engineering Design	Nonlin. Dyn. Eng. Design
MS15	Energy Transfer and Harvesting in Nonlinear Systems	Energy Transfer
MS16	Random Dynamical Systems - Recent Advances and New Directions	Random Dyn. Sys.
MS17	Time-periodic systems	Time-periodic Sys.
MS18	Control and Synchronization in Nonlinear Systems	Control
MS19	Fluid-Structure Interaction	Fluid-Structure
MS20	Wave Propagation in Mechanical Systems	Wave Propagation
MS21	Traffic and Vehicle Dynamics	Traffic&Vehicle

DETAILED PROGRAMME

Sunday, 25 June 2017

15.00-21.00 **Registration**

19.00-21.00 **Ice breaker**
Aula of Building K,
Budapest University of Technology and Economics

Monday, 26 June 2017

Room 1 (KF51)

9:30-10:30 **Opening Ceremony**

10:30-11:00 **Coffee break**

Room 1 (KF51)

11:00-12:00 **Keynote lecture**

**Particles - Simulating Complicated Processes
with Meshfree Methods**

Peter Eberhard

University of Stuttgart, Germany

12:00-13:30 **Lunch break**

13:30 - 15:30 MS 09 / I.
Nonlinear Dynamics in Engineering Systems

Chair:

Yuri Vladimirovich Mikhlin

Co-chair:

Alois Steindl

13:30

ID 33

Response regimes in equivalent mechanical model of weakly nonlinear liquid sloshing

Maor Farid, Oleg Gendelman

Technion – Israel Institute of Technology, Department of Mechanical Engineering, Haifa, Israel

13.50

ID 89

Inertial effects in thermoacoustic subcritical bifurcation

Giacomo Bonciolini, Edouard Boujo, Nicolas Noiray

ETH Zürich, Mechanical Engineering Department, Zürich, Switzerland

14.10

ID 138

Bifurcation analysis of non-smooth floating bodies

Dane Sequeira, Brian Mann

Duke University, Mechanical Engineering and Materials Science, Durham, USA

14.30

ID 272

Flutter instability of a visco-elastic belt drive

Alois Steindl

Vienna University of Technology, Institute for Mechanics and Mechatronics,

Vienna, Austria

14.50

ID 338

Motion planning problem for a finite-dimensional approximation of the Navier-Stokes equations

Alexander Zuyev

Max Planck Institute for Dynamics of Complex Technical Systems, Computational Methods in Systems and Control Theory, Magdeburg, Germany

15.10

ID 456

Forced vibrations of a string in the presence of a smooth unilateral obstacle

Harkirat Singh, Pankaj Wahi

Indian Institute of Technology Kanpur, Mechanical Engineering, Kanpur, India

13:30 - 15:30 MS 11 / I.
Systems with Time Delay

Chair:
Zaihua Wang

Co-chair:
Tamas Insperger

13:30 ID 373
Control of amplitude chimeras by time delay in dynamical networks
Eckehard Schöll

Technische Universität Berlin, Physics, Berlin, Germany

13.50 ID 62
Delay-differential equations applied to queueing theory
Jamol Pender¹, Richard Rand², Elizabeth Wesson²
¹*Cornell University, Department of Operations Research and Information Engineering, Ithaca, USA*
²*Cornell University, Department of Mathematics, Ithaca, USA*

14.10 ID 366
Folding tori and Chenciner bubbles in an ENSO model with delayed feedback
Andrew Keane, Bernd Krauskopf, Claire Postlethwaite
University of Auckland, Department of Mathematics, Auckland, New Zealand

14.30 ID 117
Period-1 oscillations of a state-dependent delayed TCP model with PIE queue management policy via high-dimensional harmonic balance method
Lijun Pei
Zhengzhou University, School of Mathematics and Statistics, Zhengzhou, China

14.50 ID 51
Optimization criterions of a multi-time-delay controlled isolation system with asymmetrical nonlinearity
Xiuting Sun¹, Shu Zhang², Jian Xu², Huijie Yu¹, Shenlong Wang¹, Yao Yan³
¹*University of Shanghai for Science and Technology, Department of Mechanical Engineering, Shanghai, China*
²*Tongji University, School of Aerospace Engineering and Applied Mechanics, Shanghai, China*
³*University of Electronic Science and Technology of China, School of Aeronautics and Astronautics, Chengdu, China*

15.10

ID 447

Galerkin approximations for the pole placement of time delayed systems

Shanti Swaroop Kandala, C. P. Vyasarayani

Indian institute of Technology Hyderabad, Department of Mechanical and Aerospace Engineering, Hyderabad, India

Room 3 (K155)

13:30 - 15:30

MS 03 / I.

Computational Methods

Chair:

Harry Dankowicz

Co-chair:

András Árpád Sipos

13:30

ID 166

Computing solution surfaces of quasilinear PDE's by continuation

Pablo Aguirre

Universidad Técnica Federico Santa María, Departamento de Matemática, Valparaíso, Chile

13.50

ID 268

Bifurcation analysis of nonlinear normal modes with the harmonic balance method

Clément Grenat¹, Sébastien Baguet¹, Régis Dufour¹,
Claude Henri Lamarque²

¹INSA Lyon (Institut National des Sciences Appliquées), LaMCoS CNRS UMR 5259, Villeurbanne, France

²ENTPE (Ecole Nationale des Travaux Publics de l'Etat), LTDS, UMR CNRS 5513, Vaulx-en-Velin, France

14.10

ID 337

Control-based continuation of unstable pedestrian flows

Ilias Panagiotopoulos

University of Rostock, Department of Mathematics, Rostock, Germany

14.30

ID 376

Embedded construction of adjoint equations for optimization using continuation

Mingwu Li, Cole Anderson, Harry Dankowicz

University of Illinois at Urbana-Champaign, Department of Mechanical Science and Engineering, Illinois, USA

MONDAY

14.50

ID 434

Tracking critical points on evolving curves and surfaces

Gábor Domokos¹, Zsolt Lángi², András Árpád Sipos¹

¹Budapest University of Technology and Economics, Department of Mechanics, Materials and Structures, Budapest, Hungary

²Budapest University of Technology and Economics, Department of Geometry, Budapest, Hungary

15.10

ID 451

Continuation of periodic orbits in symmetric conservative systems: an application to the planar $2k+1$ body problem

Jorge Galan Vioque¹, Abimael Bengochea²,
Ernesto Perez Chavela³

¹Universidad de Sevilla, Departamento de Matemática, Sevilla, Spain

²Universidad Autonoma Mexico, Departamento de Matemática, Mexico City, Mexico

³Instituto Tecnológico Autónomo de México, Departamento de Matemática, Mexico City, Mexico

Room 4 (K134)

13:30 - 15:30

MS 08 / I.

Nonlinear Phenomena in Mechanical and Structural Systems

Chair:

Bala Balachandran

Co-chair:

Sotirios Natsiavas

13:30

ID 18

Irregular dynamics of an elliptic vortex in an oscillatory nonlinear flow

Eugene Ryzhov¹, Konstantin Koshel¹, Dmitry Ovcharenko²

¹Pacific Oceanological Institute of FEB RAS, Geophysical Hydrodynamics, Vladivostok, Russia

²Far Eastern Federal University, Applied Mechanics, Vladivostok, Russia

13:50

ID 106

Heave-pitch-roll nonlinear dynamics of a spar platform

Elvidio Gavassoni

Federal University of Paraná, Department of Civil Construction, Curitiba, Brazil

14.10

ID 294

Steady streaming in a vibrating channel with ratchet

Jie Yu

Stony Brook University, Department of Civil Engineering, Stony Brook, United States of America

MONDAY

- 14.30** **ID 382**
Bifurcations in implicit map - application to surface location error in milling processes
Adam Kiss K, Daniel Bachrathy, Gábor Stépán
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary
- 14.50** **ID 97**
Nonlinear resonances of a rigid-flexible antenna system
Bensong Yu, Bensong Jin, Xiumin Gao, Ti Chen
Nanjing University of Aeronautics and Astronautics, State Key Lab of Mechanics and Control of Mechanical Structures, Nanjing, China
- 15.10** **ID 370**
Nonlinear vibrations of viscoelastic cylindrical shells with internal flowing fluid
Zenon Del Prado¹, Paulo Gonçalves²
¹*Federal University of Goias, School of Civil Engineering, Goiania, Brazil*
²*Pontifícia Universidade Católica do Rio de Janeiro, Department of Civil Engineering, Rio de Janeiro, Brazil*

Room 5 (K150)

- 13:30 - 15:30** **MS 18 / I.**
Control and Synchronization in Nonlinear Systems
- Chair:** Nathan van de Wouw
Co-chair: Marc Jungers
- 13:30** **ID 100**
Control of mechanical systems with uncertain set-valued friction
Ruud Beerens, Maurice Heemels, Nathan Van de Wouw, Henk Nijmeijer
Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands
- 13.50** **ID 111**
Control of multistability in vibro-impact systems
Yang Liu
University of Exeter, College of Engineering, Mathematics and Physical Sciences, Exeter, United Kingdom
- 14.10** **ID 203**
On the problem of control resonance oscillations of a mechanical system with unbalanced exciters
Sergey Eremeykin, Grigory Panovko, Alexander Shokhin
Mechanical Engineering Research Institute of RAS, Department of Vibrational Bio-Mechanics, Moscow, Russia

MONDAY

14.30

ID 221

Sufficient conditions for convergence of discrete-time Lur'e type systems

Marc Jungers¹, Nathan Van de Wouw²

¹CNRS, Centre de Recherche en Automatique de Nancy (CRAN), Nancy, France

²Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands

14.50

ID 240

Active vibration control of a nonlinear system using pole placement

Maryam Ghandchi Tehrani¹, Gaetan Kerschen²,
Thibaut Detroux²

¹University of Southampton, Institute of Sound and Vibration Research,
Southampton, United Kingdom

²University of Liege, Department of Aerospace and Mechanical Engineering,
Liege, Belgium

15.10

ID 511

Autoresonant excitation and control of parametric vibration

Vladimir Babitsky¹, Abolfazl Zahedi²

¹Loughborough University, Wolfson School of Mechanical and Manufacturing
Engineering, Loughborough, United Kingdom

²University of Manchester, School of Mechanical, Aerospace and Civil Engineering,
Manchester, United Kingdom

Room 6 (KF81)

13:30 - 15:30

**MS 10 / I.
Non-Smooth Dynamics**

Chair:

Vincent Acary

Co-chair:

Remco Ingmar Leine

13:30

ID 38

Control of a vertical mode of a cable by a nonsmooth oscillator

Alireza Ture Savadkoohi

ENTPE (Ecole Nationale des Travaux Publics de l'Etat), LTDS UMR CNRS 5513,
Vaulx-en-Velin, France

13.50

ID 58

Investigation of the dynamics of the wiper blade around the reversal

Motoki Unno¹, Atsushi Shibata², Hiroshi Yabuno¹,
Dai Yanagisawa³, Tomonori Nakano³

¹University of Tsukuba, Graduate School of System and Information Engineering, Tsukuba, Japan

²Keio University, Faculty of Science and Technology, Yokohama, Japan

³Mitsuba Corporation, Kiryu, Japan

MONDAY

- 14.10 ID 181**
Dynamic analysis of a cantilever beam subject to a moving mass under unilateral constraint
 Lucio Demeio
Università Politecnica delle Marche, Dipartimento di Ingegneria Industriale e Scienze Matematiche, Ancona, Italy
- 14.30 ID 259**
Towards an optimal control framework for non-smooth mechanical systems
 Reza Kianifar, Remco Ingmar Leine
University of Stuttgart, Institute for Nonlinear Mechanics, Stuttgart, Germany
- 14.50 ID 348**
Nonlinear dynamics of oscillators with shape memory alloy
 Sebastian Tatzko, Jonas Böttcher
Institute of Dynamics and Vibration Research, Leibniz Universität Hannover, Department of Mechanical Engineering, Hannover, Germany
- 15.10 ID 399**
On the dynamics of dimpled electrostatic MEMS actuators
 Ayman Alneamy¹, Majed Al-Ghamdi¹, Mahmoud Khater², Sangtak Park¹, Eihab Abdel-Rahman¹, Glenn Heppler¹, Beichen Li³, Ridha Almikhlafi¹
¹University of Waterloo, Systems Design Engineering, Waterloo, Canada
²KFUPM, Mechanical Engineering, Dahrn, Saudi Arabia
³University of Waterloo, Mechanical and Mechatronics Engineering, Waterloo, Canada

Room 7 (KF88)

- 13:30 - 15:30 MS 07 / I.**
Dynamics and Optimization of Multibody Systems
- Chair:** Felix L. Chernousko
Co-chair: Igor Zeidis
- 13:30 ID 5**
Rigidity constraints in analytical mechanics
 René Souchet
Buxerolles, France
- 13:50 ID 60**
Two-dimensional motion of a body carrying movable internal masses
 Felix Chernousko
Institute for Problems in Mechanics, Russian Academy of Sciences, Moscow, Russia

14.10

ID 173

A three field weak formulation for integration of the equations of motion of multibody systems subject to equality constraints

Elias Paraskevopoulos¹, Nikolaos Potosakis¹, Sotirios Natsiavas²

¹*Aristotle University, Thessaloniki, Greece, Department of Mechanical Engineering, Thessaloniki, Greece*

²*Aristotle University, Thessaloniki, Greece, Faculty of Mechanical Engineering, Thessaloniki, Greece*

14.30

ID 362

The discretized Coulomb friction model in a non-singular complementarity formulation for multibody systems with contacts

Albert Peiret¹, József Kövecses¹, Josep M. Font-Llagunes²

¹*McGill University, Mechanical Engineering, Montreal, Canada*

²*Universitat Politècnica de Catalunya, Mechanical Engineering, Barcelona, Spain*

14.50

ID 387

Locomotion conditions for a two-body system on a rough inclined plane

Nikolay Bolotnik¹, Philipp Schorr², Igor Zeidis², Klaus Zimmermann²

¹*Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Robotics and Mechatronics, Moscow, Russia*

²*Technische Universität Ilmenau, Department of Mechanical Engineering, Ilmenau, Germany*

15.10

ID 439

Non-reverse motion of a two-body system along a straight line on a rough horizontal plane

Nikolay Bolotnik¹, Tatiana Figurina², Pavel Gubko¹

¹*Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Robotics and Mechatronics, Moscow, Russia*

²*Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Control of Mechanical Systems, Moscow, Russia*

Room 8 (KF82)

13:30 - 15:30

MS 19 / I.

Fluid-Structure Interaction

Chair:

Andrei Metrikine

Co-chair:

Oded Gottlieb

MONDAY

13:30

ID 202

Analysis of stability transitions in a microswimmer with superparamagnetic head

Yuval Harduf, [Yizhar Or](#)

Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

13:50

ID 118

Cascade of bifurcations in nonlinear transonic panel flutter oscillations

Vasily Vedeneev¹, Anastasia Shishaeva¹, Andrey Aksenov²

¹*Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia*

²*Tesis LTD, Moscow, Russia*

14.10

ID 150

Slow-invariant-manifold resonance capture in vortex-induced vibration of a circular cylinder with a nonlinear dissipative rotator

Antoine Blanchard¹, Oleg Gendelman², Lawrence Bergman¹, [Alexander Vakakis](#)³

¹*University of Illinois at Urbana-Champaign, Department of Aerospace Engineering, Champaign, USA*

²*Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Tel Aviv, Israel*

³*University of Illinois at Urbana-Champaign, Department of Mechanical Science and Engineering, Champaign, USA*

14.30

ID 204

Computing the viscous fluid flow between moving cylinders of an arbitrary cross-section

Alexander Petrov¹, Anastasiya Kazakova²

¹*Moscow Institute of Physics and Technology (MIPT), Department of Theoretical Mechanics, Moscow, Russia*

²*Chuvash State University, Department of Applied Mathematics, Physics and Information Technologies, Cheboksary, Russia*

14.50

ID 206

Nonlinear damping types in wake oscillator model for vortex-induced vibrations of 2DoF rigid structure

Victoria Kurushina, Ekaterina Pavlovskaya, Marian Wiercigroch

University of Aberdeen, Centre for Applied Dynamics Research, Aberdeen, United Kingdom

15.10

ID 261

Flow-induced vibration of a D-shape cylinder

Jisheng Zhao, Mark C. Thompson, [Kerry Hourigan](#)

Monash University, Department of Mechanical and Aerospace Engineering, Melbourne, Australia

MONDAY

13:30 - 15:30 MS 06 / I.
Fractional Derivatives

Chair:
Riccardo Caponetto

Co-chair:
Masaharu Kuroda

13:30 ID 59
Fractional-order controller design based on the Nyquist diagram for the vibration control of a flexible beam
Naoki Yoshitani, Masaharu Kuroda

University of Hyogo, Department of Mechanical Engineering, Himeji, Japan

13.50 ID 363
Chaos control in fractional-order systems using fractional Chebyshev collocation method

Eric Butcher, Morad Nazari, Arman Dabiri

University of Arizona, Aerospace and Mechanical Engineering, Tucson, USA

14.10 ID 521
Numerical solving unsteady space-fractional problems
Petr Vabishchevich

Russian Academy of Sciences, Nuclear Safety Institute, Moscow, Russia

14.30 ID 2
Calculus on Smith-Volterra-Cantor sets
Alireza Khalili Golmankhaneh

Islamic Azad University, Urmia Branch, Department of Physics, Urmia, Iran

14.50 ID 432
Fractional order PI gimbal control
Giuseppe Avon¹, Riccardo Caponetto¹, Gabriella Xibilia²

¹*University of Catania, DIEEI, Catania, Italy*

²*Università di Messina, Dipartimento di Ingegneria, Messina, Italy*

15.10 ID 353
Feedback PDalpha type iterative learning control for fractional-order human arm-support nonlinear system
Mihailo Lazarevic¹, Nikola Djurovic¹, Milan Cajic²,
Boško Cvektovic¹, Petar Mandic¹, Ljubiša Bucanovic³

¹*University of Belgrade, Faculty of Mechanical Engineering, Department of Mechanics, Belgrade, Serbia*

²*SASA, Department of Mechanics, Belgrade, Serbia*

³*Messer Tehnogas, Department EEMCS, Belgrade, Serbia*

15:30-16:00 Coffee break

16.00 - 18.00 MS 09 / II.
Nonlinear Dynamics in Engineering Systems

Chair:
Alois Steindl

Co-chair:
Alexander Fidlin

16.00 ID 87
On the dynamics of friction based tuned mass dampers
Alexander Fidlin, Nigora Gafur
Karlsruhe Institute of Technology, Institute of Engineering Mechanics, Karlsruhe, Germany

16.20 ID 465
On the effect of the deformed state of a tire on the combined wheel's rolling, sliding, and spinning with dry friction
Sergey I. Zhavoronok¹, Alexey A. Kireenkov²
¹Institute of Applied Mechanics, Russian Academy of Sciences, Mechanics of Smart and Composite Materials and Systems, Moscow, Russia
²Ishlinsky Institute for Problems in Mechanics RAS - Moscow Institute of Physics and Technology (State University), Laboratory of Mechanics of Systems Department of Higher Mathematics, Moscow - Dolgoprudny, Russia

16.40 ID 473
Improved theory of the combined dry friction in problems of pneumatics' dynamics
Alexey A. Kireenkov¹, Sergey I. Zhavoronok²
¹Ishlinsky Institute for Problems in Mechanics RAS - Moscow Institute of Physics and Technology (State University), Laboratory of Mechanics of Systems Department of Higher Mathematics, Moscow - Dolgoprudny, Russia
²Institute of Applied Mechanics, Russian Academy of Sciences, Mechanics of Smart and Composite Materials and Systems, Moscow, Russia

17.00 ID 476
Vibration decay and positioning time of sampled-data systems with dry friction
Csaba Budai¹, László Kovács², József Kövecses², Gábor Stépán³
¹Budapest University of Technology and Economics, Department of Mechatronics, Optics and Mechanical Engineering Informatics, Budapest, Hungary
²McGill University, Department of Mechanical Engineering, Montreal, Canada
³Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

17.20

ID 513

Numerical method for nonlinear vibration of contact joint structures

Loic Salles¹, Luca Pesaresi², Jason Armand¹

¹Vibration University Technology Center, Department of Mechanical Engineering, Imperial College, London, United Kingdom

²Vibration University Technology Center, Department of Mechanical Engineering, Imperial College, London, United Kingdom

17.40

ID 410

Building a test equipment for measuring chaotic behaviour in a frictional oscillator

Gábor Licskó, Gábor Csernák, Gábor Stépán

Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

Room 2 (K174)

16.00 - 18.00

MS 11 / II.

Systems with Time Delay

Chair:

Tamás Insperger

Co-chair:

Giuseppe Habib

16.00

ID 50

An online control strategy for time delayed vibration absorber

Feng Wang, Jian Xu

Tongji University, School of Aerospace Engineering and Applied Mechanics, Shanghai, China

16.20

ID 80

A probabilistic approach towards robust stability optimization, with application to vibration control

Luca Fenzi¹, Dan Pilbauer¹, Wim Michiels¹, Tomas Vyhldal²

¹KU Leuven, Department of Computer Science, Heverlee, Belgium

²Czech Technical University in Prague, Department of Instrumentation and Control Engineering, Prague, Czech Republic

16.40

ID 95

Experiment and analysis of active vibration suppression via an absorber with a tunable delay

Yixia Sun¹, Jian Xu²

¹Shanghai University of Engineering Science, School of Mechanical Engineering, Shanghai, China

²Tongji University, School of Aerospace Engineering and Applied Mechanics, Shanghai, China

MONDAY

17.00

ID 108

Cable substructuring with feedback delay

Nandor Terkovics¹, Simon Neild², Mark Lowenberg¹,
Robert Szalai³

¹University of Bristol, Department of Aerospace Engineering, Bristol, United Kingdom

²University of Bristol, Department of Mechanical Engineering, Bristol, United Kingdom

³University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom

17.20

ID 392

A nonlinear tuned vibration absorber for chatter mitigation

Giuseppe Habib¹, Gaetan Kerschen², Gabor Stepan¹

¹Budapest University of Technology and Economics, Department of Applied Mechanics,
Budapest, Hungary

²University of Liege, Aerospace and Mechanical Engineering, Liege, Belgium

Room 3 (K155)

16.00 - 18.00

MS 03 / II.

Computational Methods

Chair:

Jan Sieber

Co-chair:

Roberto Barrio

16.00

ID 63

Topological changes in slow-fast systems: chaotic neuron models

Roberto Barrio

University of Zaragoza, Department of Applied Mathematics, Zaragoza, Spain

16.20

ID 134

**Differential equations with state-dependent delays -
smooth center manifolds and normal forms**

Jan Sieber

University of Exeter, College of Engineering, Mathematics and Physical Sciences,
Exeter, United Kingdom

16.40

ID 279

**Numerical approximation of invariant manifolds for
dynamical systems with simultaneous self- and forced
excitation**

Robert Fiedler, Hartmut Hetzler

University of Kassel, Department of Mechanical Engineering, Kassel, Germany

MONDAY

17.00

ID 290

A neutral homoclinic bifurcation in a 3D map

H. G. E. Meijer¹, W. Govaerts², Y. A. Kuznetsov^{1,3}, N. Neirynck²

¹University of Twente, Department EEMCS, Enschede, The Netherlands

²Ghent University, Department of Applied Mathematics and Computer Science, Ghent, The Netherlands

³Utrecht University, Department of Mathematics, Utrecht, The Netherlands

17.20

ID 149

Homoclinic orbits embedded in one-dimensional invariant manifolds of maps

Niels Neirynck¹, Willy Govaerts¹, Hil Meijer²

¹Ghent University, Department of Applied Mathematics, Computer Science and Statistics, Ghent, Belgium

²University of Twente, Department of Applied Mathematics, Enschede, The Netherlands

17.40

ID 379

Global manifolds parametrised by isochrons

James Hannam, Bernd Krauskopf, [Hinke Osinga](#)

University of Auckland, Department of Mathematics, Auckland, New Zealand

Room 4 (K134)

16.00 - 18.00

MS 08 / II.

Nonlinear Phenomena in Mechanical and Structural Systems

Chair:

Sotirios Natsiavas

Co-chair:

Jerzy Warmiński

16.00

ID 238

Inherent control error in a multi-PD controlled double inverted pendulum

Gergely Gyebroőszki¹, Gábor Csernák²

¹Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

²MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary

16.20

ID 252

Modes of vibration of nanobeams vibrating with large displacements and actuated by DC electric tensions

Marco Alves¹, [Pedro Ribeiro](#)²

¹Faculty of Engineering, University of Porto, DEMec, Porto, Portugal

²Faculty of Engineering, University of Porto, DEMec/INEGI, Porto, Portugal

MONDAY

16.40

ID 345

Experimental investigation of the friction-induced instabilities at the origin of wet belt squeal

Simon Gatignol¹, Thierry Demassougne², Alain Le Bot¹

¹Laboratoire de Tribologie et de Dynamique des Systèmes, TPCDI, Lyon, France

²HUTCHINSON, HUTCHINSON SNC, Joué-lès-Tours, France

17.00

ID 402

Experimental nonlinear phenomena in structures with multiple equilibria controlled by boundary displacements: ultra-fast decay of coupled vibrations

Ioannis Georgiou¹, Anil Bajaj²

¹National Technical University of Athens, School of Naval Architecture and Marine Engineering, Athens, Greece

²Purdue University, School of Mechanical Engineering, West Lafayette, USA

17.20

ID 499

Frequency response of P-mode intrinsic localized mode

Edmon Perkins

Auburn University, Department of Mechanical Engineering, Auburn, USA

17.40

ID 507

Analysis of dry galloping on inclined cables under stationary wind

Daniele Zulli¹, Giuseppe Piccardo², Angelo Luongo¹

¹University of L'Aquila, Department of Civil, Architectural and Environmental Engineering, L'Aquila, Italy

²University of Genoa, Department of Civil, Chemical and Environmental Engineering, Genoa, Italy

Room 5 (K150)

16.00 - 18.00

MS 18 / II.

Control and Synchronization in Nonlinear Systems

Chair:

Bernard Brogliato

Co-chair:

Nathan van de Wouw

16.00

ID 37

A real-time gesture classification using surface EMG to control a robotics hand

Yannick Aoustin

University of Nantes, Department of Mechanical Engineering, Nantes, France

MONDAY

16.20

ID 75

**Reference spreading trajectory tracking control:
experimental analysis on a one-degree-of-freedom setup**

Mark Rijnen, Alessandro Saccon, Henk Nijmeijer

*Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands*

16.40

ID 229

**Dynamic control of 3D directional drilling systems
with state estimation**

Octavio Antonio Villarreal Magaña¹, Emmanuel Detournay²,
Nathan Van de Wouw³

¹*Delft University of Technology, Delft Center for Systems and Control,
Delft, The Netherlands*

²*University of Minnesota, Department of Civil, Environmental and Geo-Engineering,
Minneapolis, USA*

³*Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands*

17.00

ID 316

**Position control of an electro-pneumatic clutch using
Takagi-Sugeno techniques**

Robert Prabel, Harald Aschemann

University of Rostock, Faculty of Mechanical Engineering, Rostock, Germany

17.20

ID 20

**Decentralized guaranteed cost control for synchronization
in networks of linear singularly perturbed systems**

Jihene Ben Rejeb¹, Irinel-Constantin Morarescu²,
Jamal Daafouz²

¹*University of Lorraine, Nancy, France*

²*University of Lorraine, School of Mechanical and Electrical Engineering, Nancy, France*

Room 6 (KF81)

16.00- 18.00

MS 10 / II.

Non-Smooth Dynamics

Chair:

Claude-Henri Lamarque

Co-chair:

Vincent Acary

MONDAY

- 16.00 ID 73**
Anisotropic dry friction with non-convex force reservoirs: modeling and experiments
 Simon Walker, Remco Ingmar Leine
University of Stuttgart, Institute for Nonlinear Mechanics, Stuttgart, Germany
- 16.20 ID 248**
An augmented Lagrangian frictional contact formulation for nonsmooth multibody systems
 Javier Galvez Buezo¹, Alberto Cardona², Federico Cavalieri², Olivier Bruls¹
¹*University of Liege, Department of Aerospace and Mechanical Engineering, Liege, Belgium*
²*Centro de Investigación de Métodos Computacionales (CIMEC), Santa Fe, Argentina*
- 16.40 ID 282**
Lyapunov stability of a planar rigid body with two frictional point contacts
 Péter L. Várkonyi¹, Yizhar Or²
¹*Budapest University of Technology and Economics, Department of Mechanics, Materials and Structures, Budapest, Hungary*
²*Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel*
- 17.00 ID 368**
Frictional passive damping in a beam on foundation under moving loads
 Rita Corrêa, Fernando Simões, António Pinto da Costa
Departamento de Engenharia Civil, Instituto Superior Técnico, Lisboa, Portugal
- 17.20 ID 440**
Discontinuous dynamics of wheels with a towed axis
 Mate Antali, Gabor Stepan
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

Room 7 (KF88)

- 16.00- 18.00 MS 07 / II.**
Dynamics and Optimization of Multibody Systems
- Chair:** József Kövecses **Co-chair:** Stefan Chwastek
- 16.00 ID 15**
Selected aspects involved in dynamics and optimization of cranes with a pivoting boom
 Stefan Chwastek
Cracow University of Technology, Mechanical Department, Cracow, Poland

MONDAY

16.20

ID 16

Model of person balancing on the seesaw

Alexander Formalskii, Pavel Kruchinin

*Lomonosov Moscow State University, Department of Applied Mechanics and Control,
Moscow, Russia*

16.40

ID 167

Dynamically balanced optimal gait generations for the biped walking on stairs using GA and GA-NN

Lulu Gong, Yunpeng Li, Ruowei Zhao, Zhenghai Zhang,
Weikang Zeng

Tongji University, School of Life Sciences and Technology, Shanghai, China

17.00

ID 196

Chain fountain dynamics

Friedrich Pfeiffer¹, Johannes Mayet²

¹*Technical University of Munich, Institute for Applied Mechanics, Muenchen, Germany*

²*Technical University of Munich, Institute for Applied Mechanics, Muenchen, Georgia*

17.20

ID 217

Analysis of passive wearable spring-clutch device for energy saving during walking

Roei Keren, Yizhar Or

Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

17.40

ID 235

Analysis of underactuated dynamic locomotion systems using perturbation expansion - the twistcar toy example

Ofir Chakon, Yizhar Or

Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

Room 8 (KF82)

16.00- 18.00

MS 19 / II.

Fluid-Structure Interaction

Chair:

Oded Gottlieb

Co-chair:

Kerry Hourigan

16.00

ID 135

Robust maneuver load alleviation via LPV aeroservoelastic model

Hongkun Li, Huang Rui, Yonghui Zhao, Haiyan Hu

*Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering,
Nanjing, China*

MONDAY

16.20

ID 179

Modular approach for the modeling and dynamic analysis of a pipe conveying fluid

Renato Maia Matarazzo Orsino, Celso Pupo Pesce

Universidade de São Paulo, Departamento de Engenharia Mecânica, São Paulo, Brazil

16.40

ID 109

Periodic regimes caused by ice-fluid-simple oscillator interaction

Andrei Abramian¹, Dmitry Indeitsev²

¹*Institute of Problems of Mechanical Engineering Russian Academy of Sciences, Department of Applied Mathematics, Saint Petersburg, Russia*

²*Institute of Problems of Mechanical Engineering Russian Academy of Sciences, Applied Mechanics, Saint Petersburg, Russia*

17.00

ID 274

Stabilization of a multi-tethered lighter-than-air rigid-body sphere undergoing vortex-induced vibrations in uniform flow
La Mi¹, Oded Gottlieb²

¹*Technion – Israel Institute of Technology, Autonomous Systems and Robotics Program, Haifa, Israel*

²*Technion – Israel Institute of Technology, Mechanical Engineering, Haifa, Israel*

17.20

ID 515

Intermittent oscillations of elastic structure in fluctuating axial fluid flow

S. Krishna Kumar¹, Sayan Gupta², Sunetra Sarkar³

¹*Department of Applied Mechanics, Indian Institute of Technology Madras, Chennai, India*

²*Department of Applied Mechanics, Indian Institute of Technology Madras, Applied Mechanics, Chennai, India*

³*Department of Aerospace Engineering, Indian Institute of Technology Madras, Aerospace Engineering, Chennai, India*

17.40

ID 284

Flutter of plate in one side flow

Lifeng Wang

Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering, Nanjing, China

**16.00- 18.00 MS 06 / II.
Fractional Derivatives**

Chair:
Dana Copot

Co-chair:
Péter Béda

16.00

ID 9

Contributions of the pool of long-lived chronically infected CD4+ T cells in HIV dynamics: a fractional-order approach

Ana Carvalho¹, Carla Pinto²

¹*Faculty of Sciences, University of Porto, Department of Mathematics, Porto, Portugal*

²*School of Engineering, Polytechnic of Porto, Porto, Portugal*

16.20

ID 116

Generic bifurcations at nonlocal continua described by fractional calculus

Peter Béda

Budapest University of Technology and Economics, Department of Vehicle Elements and Vehicle-structure Analysis, Budapest, Hungary

16.40

ID 160

Stability of fractional positive continuous-time and discrete-time nonlinear systems

Tadeusz Kaczorek

Bialystok University of Technology, Faculty of Electrical Engineering, Bialystok, Poland

17.00

ID 180

Combined resonance of a nonlocal nanobeam on fractional Pasternak-type viscoelastic foundation

Milan Cajić¹, Danilo Karličić¹, Mihailo Lazarević², Wen Chen³

¹*Mathematical Institute of Serbian Academy of Sciences and Arts, Department of Mechanics, Belgrade, Serbia*

²*University of Belgrade - Faculty of Mechanical Engineering, Department of Mechanics, Belgrade, Serbia*

³*Hohai University, Institute of Soft Matter Mechanics, Department of Engineering Mechanics, Nanjing, China*

17.20

ID 242

Generalized fractional order reset element (GFrORE)

Niranjan Saikumar, Hassan HosseinNia

Technische Universiteit Delft, Precision and Microsystem Engineering, Delft, The Netherlands

Tuesday, 27 June, 2017

Room 1 (KF51)

08.30 - 10.30 **MS 09 / III.**
Nonlinear Dynamics in Engineering Systems

Chair:
Livija Cveticanin

Co-chair:
Yuri Vladimirovich Mikhlin

08.30 **ID 110**
Forced and damped solitons in cyclic and symmetric structures

Filipe Fontanela¹, Aurelien Grolet², Loic Salles¹,
Amin Chabchoub³, Norbert Hoffmann¹

¹Imperial College London, Department of Mechanical Engineering,
London, United Kingdom

²Arts et Metiers ParisTech, Department of Mechanical Engineering, Lille, France

³Aalto University, Department of Mechanical Engineering, Aalto, Finland

08.50 **ID 283**
**On a family of gradient-free control functions
for extremum seeking problems**

Victoria Grushkovskaya, Christian Ebenbauer

University of Stuttgart, Institute for Systems Theory and Automatic Control,
Stuttgart, Germany

09.10 **ID 305**
**Non-classical nonlinear normal vibration modes
in mechanical systems**

Yuri Vladimirovich Mikhlin

National Technical University "KhPI", Applied Mathematics, Kharkov, Ukraine

09.30 **ID 377**
Preloading in nonlinear oscillator
Zvonko Rakaric, Livija Cveticanin, Miodrag Zukovic

University of Novi Sad, Faculty of Technical Sciences, Novi Sad, Serbia

08.30 - 10.30 MS 11 / III.
Systems with Time Delay

Chair:
Eric Butcher

Co-chair:
Zaihua Wang

08.30 ID 105
Stability analysis of machining processes with parameter uncertainty
Dominik Hamann, Nico-Philipp Walz, Achim Fischer, Michael Hanss, Peter Eberhard
University of Stuttgart, Institute of Engineering and Computational Mechanics, Stuttgart, Germany

08.50 ID 245
Influence of frictional mechanism on chatter vibrations in cutting process
Andrzej Weremczuk, Rafał Rusinek, Jerzy Warmański
Lublin University of Technology, Department of Applied Mechanics, Lublin, Poland

09.10 ID 384
Runout in milling: Tiny cause with significant effects
Andreas Otto, Günter Radons
Chemnitz University of Technology, Institute of Physics, Chemnitz, Germany

09.30 ID 416
Dynamics in milling pocket structures
Song Ren, Xinhua Long
Shanghai Jiao Tong University, Department of Mechanical Engineering, Shanghai, China

09.50 ID 431
Fast and accurate estimation of the unconditional stability threshold in milling by including the effects of tooling system bending
Giovanni Totis, Marco Sortino
University of Udine, Polytechnic Department of Engineering and Architecture, Udine, Italy

10.10 ID 466
A mechanistic ploughing model for chatter magnitude limitation in thin-walled parts turning
Mikhail Guskov
Arts et Metiers ParisTech, PIMM Laboratory, Paris, France

08.30 - 10.30 MS 03 / III.
Computational Methods

Chair:
Themistoklis Sapsis

Co-chair:
Robert Szalai

08.30 ID 69
Capturing similarity solutions in multidimensional Burgers' equation
Jens Rottmann-Matthes
Karlsruhe Institute of Technology, Department of Mathematics, Karlsruhe, Germany

08.50 ID 374
Differential positivity for nonlinear consensus
Fulvio Forni
University of Cambridge, Department of Engineering, Cambridge, United Kingdom

09.10 ID 420
Nonlinear model identification and spectral submanifolds for multi-degree-of-freedom mechanical vibrations
Robert Szalai¹, George Haller²
¹*University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom*
²*ETH Zürich, Mechanical Engineering, Zürich, Switzerland*

09.30 ID 469
Harmonic balance method with iterative frequency technique for nonlinear oscillators
Tien Hoang, Denis Duhamel, Gilles Foret
Ecole des Ponts ParisTech, Laboratoire NAVIER, Champs sur Marne, France

09.50 ID 493
Robustness of coherent sets computations
Kathrin Padberg-Gehle, Anna Kluecker
Leuphana University of Lüneburg, Applied Mathematics, Lüneburg, Germany

08.30 - 10.30 MS 08 / III.
Nonlinear Phenomena in Mechanical and Structural Systems

Chair:
Jerzy Warmański

Co-chair:
Bala Balachandran

08.30 ID 227
Experimental validation of vibro-impact force models using numeric simulation and perturbation methods
Geraldo Rebouças, Ilmar Santos, Jon Juel Thomsen
Technical University of Denmark, Department of Mechanical Engineering, Kgs. Lyngby, Denmark

08.50 ID 234
Parametric vibrations of a rotating thin-walled composite blade subjected to base excitation
Jaroslaw Latański, Jerzy Warmański
Lublin University of Technology, Applied Mechanics, Lublin, Poland

09.10 ID 323
Modeling of the dynamics of an autoparametric system with the spherical pendulum
Danuta Sado, Jan Freundlich, Anna Bobrowska
Warsaw University of Technology, Institute of Machine Design Fundamentals, Warsaw, Poland

09.30 ID 327
Dynamics of a strongly nonlinear mechanical system: a case of dissipation-induced instability
Márcio José Horta Dantas
Universidade Federal de Uberlândia, Faculdade de Matemática, UFU, Uberlândia, Brazil

09.50 ID 381
Parametrically excited inertial sensors
S. Amir Mousavi Lajimi, Eihab Abdel-Rahman
University of Waterloo, Systems Design Engineering, Waterloo, Canada

10.10 ID 223
Homoclinic Chaos near resonances in coupled SQUID
Vassilios Rothos
Aristotle University, Thessaloniki, Greece, Department of Mechanical Engineering, Thessaloniki, Greece

08.30 - 10.30 MS 18 / III.
Control and Synchronization in Nonlinear Systems

Chair:
Olivier Brls

Co-chair:
Bob Rink

08.30 ID 332
Implicit finite element formulation of the inverse dynamics of vibrating robots

Olivier Brls¹, Arthur Lismonde¹, Valentin Sonneville²

¹University of Liege, Department of Aerospace and Mechanical Engineering, Liege, Belgium

²University of Maryland, Department of Aerospace Engineering, Maryland, USA

08.50 ID 286
Nonlinear normal modes of coupled van der Pol oscillators exhibiting synchronisation

Jithin Velayudhan, Bipin Balaram

Amrita Vishwa Vidyapeetham, Department of Mechanical Engineering, Coimbatore, India

09.10 ID 328
Mixed synchronization in a triplet of coupled mechanical oscillators

Jasper Borreman¹, Henk Nijmeijer¹, Joaquin Alvarez²,
Jonatan Pena Ramirez²

¹Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands

²CICESE, Department of Electronics, Ensenada, Mexico

09.30 ID 380
Synchronisation of beams attached to a rotating hub

Zofia Szmit, Jerzy Warminski, Jaroslaw Latalski

Lublin University of Technology, Applied Mechanics, Lublin, Poland

09.50 ID 386
The emergence and breaking of synchrony in networks of dynamical systems

Bob Rink

Vrije Universiteit Amsterdam, Department of Mathematics, Amsterdam, The Netherlands

10.10 ID 524
Role of phase synchronisation in turbulence

Sara Moradi¹, Bogdan Teaca², Johan Anderson³

¹Royal Military Academy, Laboratory for Plasma Physics -LPP-ERM/KMS, Brussels, Belgium

²Coventry University, Applied Mathematics Research Centre, Coventry, United Kingdom

³Chalmers University of Technology, Department of Earth and Space Sciences,
Gteborg, Sweden

08.30 - 10.30 MS 10 / III.
Non-Smooth Dynamics

Chair:

Claude-Henri Lamarque

Co-chair:

Remco Ingmar Leine

08.30

ID 42

Analysis of pivoting algorithms for LCPs in redundant contact dynamics

Andreas Enzenhöfer¹, Marek Teichmann², József Kövecses¹

¹McGill University, Department of Mechanical Engineering, Montreal, Canada

²CM Labs Simulations, Montreal, Canada

08.50

ID 83

Comparison of Moreau-type integrators based on the time finite element discretization of the virtual action

Giuseppe Capobianco, Tom Winandy, Simon R. Eugster, Remco Ingmar Leine

University of Stuttgart, Institute for Nonlinear Mechanics, Stuttgart, Germany

09.10

ID 85

Worst-case analysis of approximate straight-line motion mechanism with link tolerances and joint clearances

Narendra Akhadkar¹, Vincent Acary², Bernard Brogliato²

¹Schneider Electric, Grenoble, France

²INRIA, Grenoble, France

09.30

ID 205

Time-stepping scheme for mechanical systems with unilateral constraints and time-delays

Benjamin Biemond¹, Wim Michiels²

¹Netherlands Organization for Applied Scientific Research,

Department of Optomechatronics, Delft, The Netherlands

²KU Leuven, Department of Computer Science, Heverlee, Belgium

09.50

ID 253

Modification of Moreau-Jean's scheme for energy conservation in inelastic impact dynamics

Carlos Yoong¹, Mathias Legrand¹, Vincent Acary²

¹McGill University, Department of Mechanical Engineering, Montreal, Canada

²INRIA, Project - Team Bipop, Grenoble, France

10.10

ID 301

Impact dynamics near unilaterally constrained grazing orbits

Stéphane Junca¹, Huong Le Thi¹, Mathias Legrand²,
Anders Thorin²

¹Université Côte d'Azur, Laboratoire de Mathématiques J.A. Dieudonné, Nice, France

²McGill University, Department of Mechanical Engineering, Montreal, Canada

Room 7 (KF88)

08.30 - 10.30

MS 07 / III.

Dynamics and Optimization of Multibody Systems

Chair:

Werner Schiehlen

Co-chair:

Laszlo Kovacs

08.30

ID 45

**Torsional vibration damper design using augmented
Lagrangian particle swarm optimization**

Philipp Mall¹, Alexander Fidlin², Arne Krüger¹

¹Dr. Ing. h.c. F. Porsche AG, Transmission Development, Weissach, Germany

²Karlsruhe Institute of Technology, Institute of Engineering Mechanics,
Karlsruhe, Germany

08.50

ID 94

**Dynamic topology optimization of a flexible multibody
system described by ALE-ANCF with time-varying length**

Jialiing Sun¹, Qiang Tian², Haiyan Hu²

¹Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering,
Nanjing, China

²Beijing Institute of Technology, School of Aerospace Engineering, Beijing, China

09.10

ID 107

**Distributed adaptive synchronization control for networked
Lagrange system with dynamic friction compensation**

Naijing Jiang, Shu Zhang, Jian Xu

Tongji University, School of Aerospace Engineering and Applied Mechanics,
Shanghai, China

09.30

ID 333

Control of a cart with oscillators under uncertainty

Igor Ananevskii¹, Tigran Ishkhanyan²

¹Institute for Problems in Mechanics, Russian Academy of Sciences,
Laboratory of Control of Mechanical Systems, Moscow, Russia

²Moscow Institute of Physics and Technology (MIPT), Department of Aerophysics
and Space Research, Moscow, Russia

TUESDAY

09.50

ID 460

Predictive control of robot manipulators with flexible joint

Laszlo Bencsik¹, Balint Bodor²

¹MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary

²Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

10.10

ID480

Inertia properties and their role in haptic rendering

László Gőgh, Bálint Mohácsi, László Kovács, József Kövecses

McGill University, Department of Mechanical Engineering, Montreal, Canada

Room 8 (KF82)

08.30 - 10.30

MS 02 / I.

Asymptotic Methods

Chair:

Leonid Manevitch

Co-chair:

Roman Starosta

08.30

ID 133

Non-stationary attractors in forced and damped weakly coupled pendulums

Leonid Manevitch

Semenov Institute of Chemical Physics, Russian Academy of Sciences,

Department of Polymers and Composite Materials, Moscow, Russia

08.50

ID 174

Vibrational analogue of coherent quantum Rabi oscillations in a three-body nonlinear mechanical system

Yuriy Kosevich, Valeri Smirnov, Margarita Kovaleva,

Leonid Manevitch

Semenov Institute of Chemical Physics, Russian Academy of Sciences,

Department of Polymers and Composite Materials, Moscow, Russia

09.10

ID 298

On periodic trajectories of a near-Hamiltonian autonomous dynamical system

Liubov Klimina, Boris Lokshin, Yuri Selyutskiy

Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia

TUESDAY

09.30

ID 304

Plane motion of the rigid body with the spring-damper suspension

Roman Starosta¹, Grażyna Sypniewska-Kamińska¹,
Jan Awrejcewicz²

¹Poznan University of Technology, Institute for Applied Mechanics, Poznan, Poland

²Lodz University of Technology, Department of Automatics,

Biomechanics and Mechatronics, Lodz, Poland

09.50

ID 470

Stationary and non-stationary dynamics of the parametric pendulum

Francesco Romeo¹, Leonid Manevitch²

¹Sapienza University of Rome, Department of Structural and Geotechnical Engineering,
Rome, Italy

²Semenov Institute of Chemical Physics, Russian Academy of Sciences,
Department of Polymers and Composite Materials, Moscow, Russia

10.10

ID 514

Analytical studies of a two degree-of-freedom vibro-impact system

Pawel Fritzkowski¹, Roman Starosta¹, Jan Awrejcewicz²

¹Poznan University of Technology, Institute of Applied Mechanics, Poznan, Poland

²Technical University of Lodz, Department of Automatics and Biomechanics, Lodz, Poland

Room 9 (KF87)

08.30 - 10.30

MS 01 / I.

Reduced-Order Modeling and System Identification

Chair:

Michael McFarland

Co-chair:

Huang Rui

08.30

ID 123

Nonlinear reduced-order modeling for controlled aeroelastic systems

Huang Rui

Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering,
Nanjing, China

08.50

ID 529

Prediction of transonic Aerodynamic Forces via nonlinear reduced-order models

Zhijun Yang, Huang Rui, Yonghui Zhao, Haiyan Hu

Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering,
Nanjing, China

TUESDAY

09.10

ID 354

**Particle filters with nudging in multiscale chaotic systems:
with application to the Lorenz-96 atmospheric model**

Hoong Yeong, Ryne Beeson, Navaratnam Sri Namachchivaya

University of Illinois at Urbana-Champaign, Aerospace Engineering, Urbana, USA

09.30

ID 457

**Experimental identification of an aircraft piccolo tube
exhibiting nonsmooth nonlinearities**

Tilan Dossogne¹, Maarten Schoukens², Bruno Bernay³,
Jean-Philippe Noel¹, Gaetan Kerschen¹

¹*University of Liege, Aerospace and Mechanical Engineering, Liege, Belgium*

²*Vrije Universiteit Brussel, Department ELEC, Brussels, Belgium*

³*SONACA SA, Icing and Dynamic Simulation, Gosselies, Belgium*

09.50

ID 490

**Model reduction for mercury porosimetry:
invasion percolation on regular, exotic and random networks**
Bendegúz Dezső Bak

*Budapest University of Technology and Economics, Department of Fluid Mechanics,
Budapest, Hungary*

10.30 - 11.00

Coffee break

Room 1 (KF51)

11.00 - 12.00

Keynote lecture

Autonomous assembly of a team of flexible spacecraft
Haiyan Hu

School of Aerospace Engineering, Beijing Institute of Technology, Beijing, China

12.00 - 13.30

Lunch break

Room 1 (KF51)

13.30 - 15.30

**MS 09 / IV.
Nonlinear Dynamics in Engineering Systems**

Chair:

Yuri Vladimirovich Mikhlin

Co-chair:

Katica Hedrih

TUESDAY

13.30

ID 158

Dynamics of ball bearings with damages at outer raceway surface - vibration response under different loads

Ivana Atanasovska¹, Natasa Soldat²

¹Mathematical Institute of Serbian Academy of Sciences and Arts,
Department of Mechanics, Belgrade, Serbia

²University of Belgrade - Faculty of Mechanical Engineering,
Machine Design Department, Belgrade, Serbia

13.50

ID 265

Nonlinear rotordynamic-thermal analysis of micro gas turbines

Frans Duijnhouwer, Rob Fey, Henk Nijmeijer

Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands

14.10

ID 281

Torsional vibrations in truck powertrains with dual mass flywheel having piecewise linear stiffness

Lina Wramner

Chalmers University of Technology, Applied Mechanics, Gothenburg, Sweden

14.30

ID 308

Non-linear dynamics of a rotor system with compliant seal

Simon Baeuerle, H. Hetzler

University of Kassel, Engineering Dynamics Group, Kassel, Germany

14.50

ID 342

Non-linear dynamics of a heavy mass particle and rolling ball along curvilinear trace of series of circle arcs:

Phase trajectory portraits, some analogies and vibro-impacts

Katica Hedrih (Stevanovic)

Mathematical Institute of Serbian Academy of Sciences and Arts,
Department of Mechanics, Belgrade, Serbia

15.10

ID 22

Evaluating nonlinear responses of asphalt concrete mixtures under time-dependent loading: in view of three representation functions

Chun-Hsing Ho, Cristina Pilar Martin Linares

Northern Arizona University, Department of Civil and Environmental Engineering,
Flagstaff, USA

13.30 - 15.30 MS 11 / IV.
Systems with Time Delay

Chair:
Zaihua Wang

Co-chair:
Tamas Insperger

13.30 ID 201
Stochastic sensitivity in dynamic bifurcations with delayed feedback revealed through multiple scales analysis
Rachel Kuske
Georgia Institute of Technology, Department of Mathematics, Atlanta, USA

13.50 ID 98
Delayed random relays
Koki Shugishita, Toru Ohira
Nagoya University, Graduate School of Mathematics, Nagoya, Japan

14.10 ID 4
On some extension of center manifold method
Pavel Nesterov
Yaroslavl State University, Department of Mathematics, Yaroslavl, Russia

14.30 ID 276
Switching to nonhyperbolic cycles from codim-2 bifurcations of equilibria in DDEs
Maikel Bosschaert¹, Yuri Kuznetsov²
¹*Hasselt University, Applied Mechanics, Hasselt, Belgium*
²*University of Utrecht, Mathematical Department, Utrecht, The Netherlands*

14.50 ID 477
Non-smooth torus to identify domain of attraction of stable milling processes
Zoltan Dombovari¹, Jokin Munoa², Rachel Kuske³, Gabor Stepan¹
¹*Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary*
²*IK4 Ideko Research Alliance, Dynamics and Control, Elgoibar, Spain*
³*Georgia Institute of Technology, School of Mathematics, Atlanta, USA*

- 13.30 - 15.30 MS 03 / IV.**
Computational Methods
- Chair:** Jan Sieber
Co-chair: Mattia Serra
- 13.30 ID 40**
Numerical study on the waveform evolution in metal material
 Lan Wei, Xin Yu, Miao Zheng, YuXia Liu
Institute of Applied Physics and Computational Mathematics, Beijing, China
- 13.50 ID 194**
Cylindrical cavity evolution in a plane parallel potential flow of the perfect incompressible fluid
 Nikita Baykov¹, Alexander Petrov²
¹*Lomonosov Moscow State University, Department of Mathematics and Mechanics, Moscow, Russia*
²*Ishlinsky Institute for Problems in Mechanics RAS, Mechanics of Systems, Moscow, Russia*
- 14.10 ID 216**
Lagrangian and Eulerian coherent structures in complex dynamical systems
 Mattia Serra, George Haller
ETH Zürich, Department of Mechanical Engineering, Zürich, Switzerland
- 14.30 ID 241**
Recent advances in the theory of Lagrangian coherent structures for three-dimensional flows
 David Oettinger, George Haller
ETH Zürich, Department of Mechanical and Process Engineering, Zürich, Switzerland
- 14.50 ID 326**
Analysis of coupled finite-volume/Monte-Carlo methods for plasma edge simulation in fusion reactors
 Giovanni Samaey¹, Matthias Baeten¹, Bert Mortier¹, Tine Baelmans^{1,2}
¹*KU Leuven, Department of Computer Science, Leuven, Belgium*
²*KU Leuven, Department of Mechanical Engineering, Leuven, Belgium*
- 15.10 ID 367**
Extraction and prediction of coherent patterns in incompressible flows through space-time Koopman analysis
 Dimitrios Giannakis
New York University, Courant Institute of Mathematical Sciences, New York, USA

13.30 - 15.30 MS 08 / IV.
Nonlinear Phenomena in Mechanical and Structural Systems

Chair:

Bala Balachandran

Co-chair:

Sotirios Natsiavas

13.30

ID 371

Experimental studies with drill string: effects of drill mud

Meryem Kanzari¹, Mohammed Yousef Alqaradawi¹,
Balakumar Balachandran²

¹*Qatar University, Mechanical Engineering, Doha, Qatar*

²*University of Maryland, Mechanical Engineering, Maryland, USA*

13.50

ID 414

**Experimental and numerical study of nonlinear galloping
oscillations interfering with vortex-induced excitation**

Claudio Mannini, Tommaso Massai, Antonino Maria Marra

University of Florence, Department of Civil and Environmental Engineering, Florence, Italy

14.10

ID 148

**Nonlinear dynamics analysis of a rotor-damper system
through nonlinear Galerkin method on approximate inertial
manifold**

Yuefang Wang¹, Jin Huang¹, Lihua Huang²

¹*Dalian University of Technology, Department of Engineering Mechanics, Dalian, China*

²*Dalian University of Technology, Faculty of Infrastructural Engineering, Dalian, China*

14.30

ID 249

**Nonlinear electromechanical interactions in rotordynamics
of electrical machines**

Felix Boy, Hartmut Hetzler

University of Kassel, Mechanical Engineering, Kassel, Germany

14.50

ID 442

Effect of softening constitutive law on column buckling

Soheil Fatehiboroujeni, Derek Hollenbeck, Sachin Goyal

University of California, Merced, Department of Mechanical Engineering, Merced, USA

15.10

ID 405

**Finding periodic solutions in the dynamics of metal cutting
via averaging**

Tamás Gábor Molnár, Tamás Insperger, Gábor Stépan

*Budapest University of Technology and Economics, Department of Applied Mechanics,
Budapest, Hungary*

13.30 - 15.30 MS 18 / IV.
Control and Synchronization in Nonlinear Systems

Chair:
Nathan van de Wouw

Co-chair:
Elena Panteley

13.30 ID 101
Effects of an external parameter on the synchronization threshold of time-delayed Hindmarsh-Rose neurons
Isaac Topiltzin, Castanedo Guerra

*Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands*

13.50 ID 190
Tweezer control for chimera states in small networks
Iryna Omelchenko¹, Oleh E. Omel'chenko²,
Anna Zakharova¹, Matthias Wolfrum², Eckehard Schöll¹
¹Technische Universität Berlin, Institut für Theoretische Physik, Berlin, Germany
²Weierstrass Institute, Berlin, Germany

14.10 ID 193
Computing partial synchronization manifolds of delay-coupled systems
Wim Michiels¹, Libo Su¹, Erik Steur², Henk Nijmeijer³
¹KU Leuven, Department of Computer Science, Heverlee, Belgium
²Eindhoven University of Technology, Institute of Complex and Molecular Systems,
Eindhoven, The Netherlands
³Eindhoven University of Technology, Mechanical Engineering,
Eindhoven, The Netherlands

14.30 ID 255
Beyond complete synchronization of identical systems: multidimensional dynamic consensus
Elena Panteley, Antonio Loria
L2S (Laboratoire des signaux et systèmes), CNRS (Centre national de la recherche scientifique), CentraleSupélec, Gif sur Yvette, France

14.50 ID 359
Delay-independent partial synchronization in networks of non-identical nonlinear systems with transmission delay coupling
Toshiki Oguchi, Manabu Suzuki, Daisuke Yanagi
Tokyo Metropolitan University, Department of Mechanical Engineering, Tokyo, Japan

15.10

ID 120

Analysis of synchronization in mutually coupled MEMS oscillators via surface acoustic waves using a simplified non-linear model

Mohana Das Govind, Manoj Pandey

Indian Institute of Technology Madras, Department of Mechanical Engineering, Chennai, India

Room 6 (KF81)

13.30 - 15.30

MS 10 / IV.

Non-Smooth Dynamics

Chair:

Remco Ingmar Leine

Co-chair:

Vincent Acary

13.30

ID 156

Low-dimensional piecewise smooth maps with an unpredictable number of switching manifolds

Viktor Avrutin¹, Zhanybai T. Zhusubaliyev², Erik Mosekilde³

¹*University of Stuttgart, Institute for Systems Theory and Automatic Control, Stuttgart, Germany*

²*Southwest State University, Department of Computer Science, Kursk, Russia*

³*Technical University of Denmark, Department of Physics, Lyngby, Denmark*

13.50

ID 164

Lyapunov stability and existence results of measure differential inclusions - applications in nonsmooth mechanics with singular mass matrices

Manuela Paschkowski

Martin Luther University Halle-Wittenberg, Institute for Mathematics, Halle, Germany

14.10

ID 178

A solution of the general single contact frictionless problem using tools of b-geometry

Sotirios Natsiavas¹, Elias Paraskevopoulos²

¹*Aristotle University, Faculty of Mechanical Engineering, Thessaloniki, Greece*

²*Aristotle University, Department of Mechanical Engineering, Thessaloniki, Greece*

14.30

ID 273

Spectrum of an impact oscillator via nonsmooth modal analysis

Anders Thorin, Mathias Legrand

McGill University, Mechanical Engineering, Montreal, Canada

TUESDAY

14.50

ID 292

**Comparison between piecewise linear and smooth dynamics:
A case study of decomposing a degenerate bifurcation**

Barnabas M. Garay, Miklós Koller, Marcell Simkó

*Pazmany Peter Catholic University, Faculty of Information Technology and Bionics,
Budapest, Hungary*

15.10

ID 296

**Fluid-structure interaction simulations of heart valves
with dynamic contact**

Maria Giuseppina Chiara Nestola, Patrick Zulian, Rolf Krause

Università della Svizzera Italiana, Institute of Computational Science, Lugano, Switzerland

Room 7 (KF88)

13.30 - 15.30

MS 13 / I.

Nonlinear Dynamics in Biological Systems

Chair:

Gergely Röst

Co-chair:

Jüri Engelbrecht

13.30

ID 14

**Waves in biomembranes with amplitude-dependent
nonlinearities**

Jüri Engelbrecht, Tanel Peets, Kert Tamm

Tallinn University of Technology, Institute of Cybernetics, Tallinn, Estonia

13.50

ID 52

**An influence of nonlinearity and discontinuity on sound
transfer in reconstructed middle ear**

Rafal Rusinek

Lublin University of Technology, Department of Applied Mechanics, Lublin, Poland

14.10

ID 128

**Monomolecular reaction networks: flux-influenced sets
and balloons**

Nicola Vassena¹, Hiroshi Matano²

¹*Free University Berlin, Department of Mathematics, Berlin, Germany*

²*University of Tokyo, Department of Mathematics, Tokyo, Japan*

14.30

ID 313

**Modeling of controllable support stiffness bio-inspired
by tactile sensor systems**

Carsten Behn, Moritz Scharff, Thomas Helbig, Danja Voges,
Hartmut Witte, Joachim Steigenberger

*Technische Universität Ilmenau, Department of Mechanical Engineering,
Ilmenau, Germany*

TUESDAY

14.50

ID 372

Analysis of oscillatory motions of chromosomes during anaphase using biomechanical oscillatory model of mitotic spindle

Andjelka Hedrih¹, Katica (Stevanović) Hedrih^{1,2}

¹*Mathematical Institute of Serbian Academy of Sciences and Arts,
Department of Mechanics, Belgrade, Serbia*

²*Faculty of Mechanical Engineering, University of Nis, Nis, Serbia*

15.10

ID 418

Dynamics of statically pre-loaded human aorta with residual stresses

Marco Amabili

McGill University, Mechanical Engineering, Montreal, Canada

Room 8 (KF82)

13.30 - 15.30

MS 02 / II.

Asymptotic Methods

Chair:

Jan Awrejcewicz

Co-chair:

Wim T. Van Horssen

13.30

ID 19

On perturbations methods and their applicability in the study of vibrations of axially moving strings and beams

Wim T. Van Horssen

*Delft University of Technology, Delft Institute of Applied Mathematics,
Delft, The Netherlands*

13.50

ID 99

On the mathematical justification of viscoelastic shell models

Gonzalo Castiñeira Veiga¹, Ángel Rodríguez-Arós²

¹*Universidade de Santiago de Compostela, Department of Applied Mathematics,
Santiago de Compostela, Spain*

²*Universidade da Coruña, Department of Mathematics, A Coruña, Spain*

14.10

ID 152

Internal resonances of a non-linear heterogeneous rod: influence of dispersion and dissipation

Igor Andrianov¹, Vladyslav Danishevskyy², Bernd Markert¹,
Graham Rogerson²

¹*RWTH Aachen University, Institute of General Mechanics, Aachen, Germany*

²*Keele University, School of Computing and Mathematics, Keele, United Kingdom*

TUESDAY

14.30

ID 256

On time-varying velocity for an axially moving string under viscous damping

Sajad H. Sandilo

*Quaid-e-Awam University of Engineering, Science and Technology,
Department of Mathematics, Nawabshah, Pakistan*

14.50

ID 428

Small-scale counter-rotating Darrieus wind turbine

Liubov Klimina¹, Ekaterina Shalimova¹, Vitaly Samsonov¹,
Ching-Huei Lin²

¹*Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia*

²*Chien Hsin University of Science and Technology, Electrical Engineering, Moscow, Russia*

15.10

ID 444

Semi-analytical investigation of unsteady free-boundary flows

Evqenii Karabut¹, Aleksander Petrov², Elena Zhuravleva³

¹*Lavrentyev Institute of Hydrodynamics, Russian Academy of Sciences,
Novosibirsk, Russia*

²*Institute for Problems in Mechanics, Russian Academy of Sciences,
Russian Academy of Sciences, Moscow, Russia*

³*Lavrentyev Institute of Hydrodynamics, Applied Mathematics, Novosibirsk, Russia*

Room 9 (KF87)

13.30 - 15.30

MS 01 / II.

Reduced-Order Modeling and System Identification

Chair:

Michael McFarland

Co-chair:

Dennis Grunert

13.30

ID 244

Towards the adoption of the stiffness evaluation procedure as non-intrusive, non-linear model reduction method in car crash simulations

Dennis Grunert, Jörg Fehr

*University of Stuttgart, Institute of Engineering and Computational Mechanics,
Stuttgart, Germany*

13.50

ID 275

Experimental frequency response synthesis for nonlinear systems

Simon Peter¹, Maren Scheel², Malte Krack², Remco Ingmar Leine¹

¹*University of Stuttgart, Institute for Nonlinear Mechanics, Stuttgart, Germany*

²*University of Stuttgart, Institute of Aircraft Propulsion Systems, Stuttgart, Germany*

TUESDAY

14.10

ID 280

Towards experimental nonlinear modal analysis of systems with nonlinear damping

Maren Scheel¹, Simon Peter², Remco Ingmar Leine², Malte Krack¹

¹University of Stuttgart, Institute of Aircraft Propulsion Systems, Stuttgart, Germany

²University of Stuttgart, Institute for Nonlinear Mechanics, Stuttgart, Germany

15.30 - 16.00

Coffee break

Room 1 (KF51)

16.00 - 18.00

MS 09 / V.

Nonlinear Dynamics in Engineering Systems

Chair:

Katica Hedrih

Co-chair:

Antonio Papangelo

16.00

ID 46

Vibration localization and snaking bifurcations in a purely mechanical system

Antonio Papangelo¹, Aurelien Grolet², Norbert Hoffmann^{1,4}, Michele Ciavarella³

¹Hamburg University of Technology, Mechanical Engineering Department, Hamburg, Germany

²ENSAM, Department of Mechanics, Lille, France

³Polytechnic of Bari, Mechanical Engineering Department, Bari, Italy

⁴Imperial College London, Department of Mechanical Engineering, London, United Kingdom

16.20

ID 168

Study on the nonlinear model reduction of the flexible multibody system described by the spatial gradient-deficient beam element of ANCF

Yixuan Tang

Nanjing University of Aeronautics and Astronautics, School of Aeronautics and Astronautics, Nanjing, China

TUESDAY

16.40

ID 218

Nonlinear phenomena in AFM arrays

Samuel Jackson, Stefanie Gutschmidt

*University of Canterbury, Department of Mechanical Engineering,
Christchurch, New Zealand*

17.00

ID 312

Saturated adaptive control of muscle-like compliant manipulation systems

Carsten Behn, Konrad Siedler

Technische Universität Ilmenau, Department of Mechanical Engineering, Ilmenau, Germany

17.20

ID 388

Power flow of nonlinear vibration isolation with high-static-low-dynamic stiffness

Zeqi Lu¹, Li-Qun Chen²

¹*Shanghai University, Shanghai Institute of Applied Mathematics and Mechanics, Shanghai, China*

²*Shanghai University, Department of Mechanics, Shanghai, China*

Room 2 (K174)

16.00 - 18.00

MS 11 / V.

Systems with Time Delay

Chair:

Eric Butcher

Co-chair:

Zaihua Wang

16.00

ID 84

Stability of time-delay systems: from integer-order to fractional-order systems

Zaihua Wang

Nanjing University of Aeronautics and Astronautics, State Key Lab of Mechanics and Control of Mechanical Structures, Nanjing, China

16.20

ID 510

Intermittent delay feedback control as an origin of physiological movement variability

Taishin Nomura¹, Yasuyuki Suzuki¹, Ken Kiyono¹, Pietro Morasso²

¹*Osaka University, Graduate School of Engineering Science, Osaka, Japan*

²*Italian Institute of Technology, Genova, Italy*

16.40

ID 426

Delayed tyre model in vehicle shimmy

Tian Mi

Southeast University, School of Mechanical Engineering, Nanjing, China

TUESDAY

17.00

ID 430

Balancing on accelerating skateboard

Balazs Varszegi¹, Denes Takacs², Tamas Insperger¹

¹*Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary*

²*MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary*

17.20

ID 462

Hopf bifurcation in a nonlinear mechanical model of human balancing with delayed PDA control

Li Zhang

Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering, Nanjing, China

17.40

ID 500

Solution of scale dynamic systems

Aftab Ahmed, Erik Verriest

Georgia Institute of Technology, Electrical and Computer Engineering, Atlanta, USA

Room 3 (K155)

16.00 - 18.00

MS 03 / V.

Computational Methods

Chair:

Themistoklis Sapsis

Co-chair:

Claudia Wulff

16.00

ID 7

An asymptotic-preserving stochastic Galerkin method for the semiconductor Boltzmann equation with random inputs and diffusive scalings

Liu Liu, Shi Jin

University of Wisconsin-Madison, Department of Mathematics, Madison, USA

16.20

ID 61

Fractional order convergence of time-discretizations for semilinear PDEs

Claudia Wulff

University of Surrey, Department of Mathematics, Guildford, United Kingdom

16.40

ID 90

Combined error estimates for numerical continuation of stochastic systems

Christian Kuehn

Technical University of Munich, Department of Mathematics, Muenchen, Germany

TUESDAY

- 17.00 ID 357**
Path-based measures of transport and expansion rates in stochastic flows
 Michal Branicki, Kenneth Uda
University of Edinburgh, Department of Mathematics, Edinburgh, United Kingdom
- 17.20 ID 360**
Probabilistic quantification of extreme events in complex systems
 Themistoklis Sapsis, Mustafa Mohamad
Massachusetts Institute of Technology, Mechanical Engineering, Cambridge, USA
- 17.40 ID 453**
Set oriented numerical methods for spatially dependent parameter uncertainty
 Michael Dellnitz, Adrian Ziessler
University of Paderborn, Department of Mathematics, Paderborn, Germany

Room 4 (K134)

- 16.00 - 18.00 MS 08 / V.**
Nonlinear Phenomena in Mechanical and Structural Systems
- Chair:** Sotirios Natsiavas **Co-chair:** Jerzy Warmański
- 16.00 ID 449**
Perturbation analysis on the dynamic behaviours of planetary gear sets with friction
 Chao Xun, Xinhua Long
Institute of Vibration, Noise and Shock, School of Mechanical Engineering, Shanghai, China
- 16.20 ID 422**
Passive/active thermal dynamics in the coupled nonlinear vibrations of laminated plates
 Valeria Settini, Eduardo Saetta, Giuseppe Rega
Sapienza University of Rome, Department of Structural and Geotechnical Engineering, Rome, Italy
- 16.40 ID 436**
Dynamics and fracture of impacted sandwich composites under time varying loads: Numerical modelling and simulations
 Vyacheslav Burlayenko
National Technical University "KhPI", Applied Mathematics, Kharkov, Ukraine

17.00

ID 448

Wrinkling patterns of thin films under finite membrane strain

Eszter Fehér, András Árpád Sipos

*Budapest University of Technology and Economics, Department of Mechanics,
Materials and Structures, Budapest, Hungary*

17.20

ID 459

Nonlinear material modelling of an airsoft pellet applied for impulse excitation

Szabolcs Berezvai, Attila Kossa, Gabor Stepan

*Budapest University of Technology and Economics, Department of Applied Mechanics,
Budapest, Hungary*

17.40

ID 237

Fatigue behavior of heat-damaged and FRP repaired beams

Rami Haddad, Yasmeen Obaidat

*Jordan University of Science and Technology, Department of Civil Engineering,
Irbid, Jordan*

Room 5 (K150)

16.00 - 18.00

MS 18 / V.

Control and Synchronization in Nonlinear Systems

Chair:

Bernard Brogliato

Co-chair:

R.H.B. Fey

16.00

ID 76

Switching between coexisting stable periodic solutions by impulsive forces with an application to a vibrating plate

D.W.M. Veldman, R.H.B. Fey, H.J. Zwart

*Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands*

16.20

ID 165

A robust-tube MPC approach for the analysis of load response of power plants

Istvan Selek, Jeno Kovacs

University of Oulu, Finland, Systems Engineering Research Group, Oulu, Finland

16.40

ID 183

Nonlinear control and stability analysis of a stroke limited inertial actuator in velocity feedback

Mattia Dal Borgo, Maryam Ghandchi Tehrani,
Stephen John Elliott

*University of Southampton, Institute of Sound and Vibration Research,
Southampton, United Kingdom*

TUESDAY

17.00

ID 232

Dynamic data-driven adaptive observations in a vortex flowfield

Ryne Beeson, Hoong Chieh Yeong, Navaratnam Sri Namachchivaya

University of Illinois at Urbana-Champaign, Department of Aerospace Engineering, Urbana, USA

17.20

ID 288

Low-pass filter with hybrid integrator-gain switching for increased bandwidth

Marcel Heertjes

Eindhoven University of Technology, Department of Mechanical Engineering, Eindhoven, The Netherlands

17.40

ID 401

Modelling and control of a simplified system under external disturbance

Gangsig Shin

KINS, Dept of safety research, Daejeon, South Korea

Room 6 (KF81)

16.00 - 18.00

MS 16 / I.

Random Dynamical Systems - Recent Advances and New Directions

Chair:

Rachel Kuske

Co-chair:

Daniil Yurchenko

16.00

ID 66

Evolutionary dynamics of membership distribution functions of a forced triple well potential system with fuzzy uncertainty

Ling Hong

Xi'an Jiaotong University, State Key Lab for Strength and Vibration, Xi'an, China

16.20

ID 169

Energy conversion in a dynamic vibro-impact system with dielectric elastomers

Gordon Thomson, Daniil Yurchenko

Heriot-Watt University, Institute of Mechanical, Process and Energy Engineering, Edinburgh, United Kingdom

16.40

ID 419

Nonlinear random vibrations of stretched beam discretized by finite difference scheme and excited by Gaussian white noise

Guo-Kang Er

University of Macau, Department of Civil and Environmental Engineering, Macau SAR, China

TUESDAY

17.00

ID 429

Approximation of top Lyapunov exponent of stochastic delayed turning model using Fokker-Planck approach

Henrik Tamas Sykora¹, Walter V. Wedig², Daniel Bachrathy¹, Gabor Stepan¹

¹*Budapest University of Technology and Economics, Applied mechanics, Budapest, Hungary*

²*Karlsruhe Institute of Technology, Institute for Applied Mechanics, Karlsruhe, Germany*

17.20

ID 177

Statistics of the response of a dry-friction oscillator stochastically excited

Roberta Lima, Rubens Sampaio

Pontifícia Universidade Católica do Rio de Janeiro, Departamento de Engenharia Mecânica, Rio de Janeiro, Brazil

Room 7 (KF88)

16.00 - 18.00

MS 13 / II.

Nonlinear Dynamics in Biological Systems

Chair:

Sachin Goyal

Co-chair:

John Milton

16.00

ID 35

Izhikevich neural networking model; Master neurons & slave neurons and applications in modeling Alzheimer's disease; Delay in the signal and eventually periodic solutions

Maksims Zigunovs^{1,4}, Michael Radin², Alexander Pisarchik³

¹*Riga Technical University, Institute of Applied Mathematics, Faculty of Computer Science and Information Technology, Riga, Latvia*

²*Rochester Institute of Technology, Department of Applied mathematics, Rochester, New York, USA*

³*Madrid Technical University, Center of Biomedical Technology, Madrid, Spain*

⁴*Liepaja University, Institute of Science and Innovative Technologies, Faculty of Science and Engineering, Liepaja, Latvia*

16.20

ID 408

**Expert stick balancing:
Levy distributions and the edge of stability**

John Milton

The Claremont Colleges, W M Keck Science Department, Claremont, USA

TUESDAY

16.40

ID 411

Three-segmented hopping leg for the analysis of human running locomotion

László Fekete¹, Bernd Krauskopf², Ambrus Zelei³

¹*Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary*

²*The University of Auckland, Department of Mathematics, Auckland, New Zealand*

³*MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary*

17.00

ID 481

Proper orthogonal decomposition analysis of impact-induced dynamics of the olive tree branch: a paradigm of a complex soft-stiff structure in biomechanics

Ioannis Georgiou

National Technical University of Athens, School of Naval Architecture and Marine Engineering, Athens, Greece

17.20

ID 505

The role of vibrations in tactile perception

Marco Barbieri, Ramona Fagiani

University of Modena and Reggio Emilia, Department of Engineering Enzo Ferrari, Modena, Italy

17.40

ID 3

Periodic orbits of a neuron model with periodic internal decay rate

Michael Radin

Rochester Institute of Technology, School of Mathematical Sciences, Rochester, New York, USA

Room 8 (KF82)

16.00 - 18.00

MS 02 / III.

Asymptotic Methods

Chair:

Igor V. Andrianov

Co-chair:

Alexey Porubov

16.00

ID 198

Control of nonlinear localized waves by an external action

Alexey Porubov

Institute of Problems of Mechanical Engineering, Department of Micromechanics of Materials, Saint Petersburg, Russia

TUESDAY

- 16.20** **ID 197**
Forced resonance vibrations of the dissipative spring-pendulum system
 Yuri Vladimirovich Mikhlin
National Technical University "KhPI", Applied Mathematics, Kharkov, Ukraine
- 16.40** **ID 343**
Energy method applied to the asymptotic methods of non-linear mechanics
 Katica Hedrih (Stevanovic)
Mathematical Institute of Serbian Academy of Sciences and Arts, Department of Mechanics, Belgrade, Serbia
- 17.00** **ID 424**
Energy transport and localization in the system of harmonically coupled pendulums
 Margarita Kovaleva, Valeri Smirnov, Leonid Manevitch
Semenov Institute of Chemical Physics, Russian Academy of Sciences, Department of Polymers and Composite Materials, Moscow, Russia
- 17.20** **ID 489**
2D control of energy transport in the locally resonant unit cell model with self excitation
 Margarita Kovaleva¹, Nina Ryazan², Yuli Starosvetsky²
¹*Semenov Institute of Chemical Physics, Russian Academy of Sciences, Department of Polymers and Composite Materials, Moscow, Russia*
²*Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel*
- 17.40** **ID 6**
Stochastic Asymptotic-preserving Galerkin methods for multiscale kinetic equations with uncertainties
 Shi Jin
Institute of Natural Sciences, Shanghai Jiao Tong University, China and Department of Mathematics, University of Wisconsin, Madison, USA

16.00 - 18.00 MS 01 / III.
Reduced-Order Modeling and System Identification

Chair:
 Michael McFarland

Co-chair:
 Li-Qun Chen

16.00 ID 65
Reduced-order modeling of strongly nonlinear systems using measured time series

Keegan Moore¹, Christopher Herrera², Mehmet Kurt³,
 Melih Eriten⁴, Michael McFarland², Lawrence Bergman²,
 Alexander Vakakis¹

¹University of Illinois at Urbana-Champaign, Department of Mechanical Science and Engineering, Champaign, USA

²University of Illinois at Urbana-Champaign, Department of Aerospace Engineering, Champaign, USA

³Stanford University, Department of Bioengineering, Stanford, USA

⁴University of Wisconsin-Madison, Department of Mechanical Engineering, Madison, USA

16.20 ID 129
Applications of spectral submanifolds in nonlinear modal analysis

Sten Ponsioen, George Haller

ETH Zürich, Institute for Mechanical Systems, Zürich, Switzerland

16.40 ID 400
Nonparametric identification of a nonlinear piezoelectric vibration energy harvester

Li-Qun Chen¹, Tianchen Yuan Yuan²

¹Shanghai University, Department of Mechanics, Shanghai, China

²Shanghai University, Shanghai Institute of Applied Mathematics and Mechanics, Shanghai, China

17.00 ID 443
Parameter estimation for nonsymmetric matrix Riccati differential equations

David Swigon

University of Pittsburgh, Department of Mathematics, Pittsburgh, USA

17.20 ID 530
Linearizability condition of nonlinear form of Riccati equation

Ruma Dutta

Ohio State University, Applied Mathematics, Columbus, USA

Room 1 (KF51)

08.30 - 10.30 **MS 09 / VI.** **Nonlinear Dynamics in Engineering Systems**

Chair:
Marco Amabili

Co-chair:
Jun Jiang

08.30 **ID 396** **Analysis of a remarkable singularity in a nonlinear DDE** Matthew Davidow¹, B Shayak², Richard Rand³

¹Cornell University, Center for Applied Mathematics, Ithaca, USA

²Cornell University, School of Mechanical and Aerospace Engineering, Ithaca, USA

³Cornell University, Department of Mathematics and Department of Mechanical and Aerospace Engineering, Ithaca, USA

08.50 **ID 417** **Identification of nonlinear damping for large-amplitude vibrations of plates and shells** Marco Amabili

McGill University, Department of Mechanical Engineering, Montreal, Canada

09.10 **ID 479** **On dynamics of a particle tethered to a rigid body by two unilateral constraints** Alexander V. Rodnikov

Moscow Aviation Institute (National Research University), Applied Mathematics and Physics, Moscow, Russia

09.30 **ID 483** **Modelling and simulation of vibrocompaction processes** Javier González Carbajal, Daniel García-Vallejo, Jaime Domínguez

Universidad de Sevilla, Mechanical and Manufacturing Engineering, Sevilla, Spain

09.50 **ID 497** **Observation of vibratory force phenomena** Tadeusz Majewski

Universidad de las Americas-Puebla, Department of Industrial and Mechanical Engineering, Puebla, Mexico

10.10 **ID 113** **Transient responses and bifurcation behavior of a piecewise smooth rotor/stator rubbing system under noise excitation** Jun Jiang

Xi'an Jiaotong University, State Key Lab for Strength and Vibration, Xi'an, China

08.30 - 10.30 MS 11 / VI.
Systems with Time Delay

Chair:
Tamas Insperger

Co-chair:
Eric Butcher

08.30 ID 485
Borehole spiraling as limit cycle of directionally unstable drilling systems

Julien Marck, Emmanuel Detournay

*University of Minnesota, Department of Civil, Environmental and Geo-Engineering,
Minneapolis, USA*

08.50 ID 330
Delay system modelling and analysis of a down-hole tool in drilling systems

Nathan Van de Wouw^{1,2,3}, Thijs Vromen¹, Emmanue Detournay²,
Henk Nijmeijer¹

¹*Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands*

²*University of Minnesota, Department of Civil, Environmental and Geo-Engineering,
Minneapolis, USA*

³*Delft University of Technology, Delft Center for Systems and Control,
Delft, The Netherlands*

09.10 ID 369
Post-critical vibrations in an auto-resonant axial-torsional vibratory drilling system

Alexander Gouskov¹, Mikhail Guskov²

¹*Bauman Moscow State Technical University, Applied Mechanics, Moscow, Russia*

²*ENSAM, PIMM Laboratory, Paris, France*

09.30 ID 29
Axial and torsional dynamics of a distributed drill string system
Ulf Jakob Flø Aarsnes¹, Nathan Van de Wouw²

¹*International Research Institute of Stavanger, Drilling & Well Technology, Oslo, Norway*

²*Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands*

09.50 ID 518
Drilling dynamics under 1:1 internal resonance between axial and torsional modes

Sunit K. Gupta, Pankaj Wahi

*Indian Institute of Technology Kanpur, Department of Mechanical Engineering,
Kanpur, India*

WEDNESDAY

10.10

ID 115

Planar motions in grinding chatter

Yao Yan

University of Electronic Science and Technology of China, School of Aeronautics and Astronautics, Chengdu, China

Room 3 (K155)

08.30 - 10.30

MS 12 / I.

Micro- and Nano-Electro-Mechanical Systems

Chair:

Anil Bajaj

Co-chair:

Slava Krilov

08.30

ID 25

Parametric amplification of acoustically-excited micromechanical oscillators using fringing electrostatic fields

Stella Lulinsky¹, Tsvi Schmilovich¹, Bojan Rob Ilic², Slava Krylov¹

¹*Tel Aviv University, School of Mechanical Engineering, Tel Aviv, Israel*

²*National Institute of Standards and Technology, Center for Nanoscale Science and Technology, Gaithersburg, USA*

08.50

ID 358

Room-temperature stochastic switching in a Duffing graphene resonator

Samer Houri, Robin Dolleman, Peter Steeneken, Herre Van der Zant

Delft University of Technology, Kavli Institute of Nanoscience, Delft, The Netherlands

09.10

ID 365

The influence of imperfections on the spatio-temporal dynamics of a parametrically excited nonlinear viscoelastic micro-beam-string

Prashant Kambali¹, Karin Mora², Oded Gottlieb¹

¹*Technion – Israel Institute of Technology, Mechanical Engineering, Haifa, Israel*

²*University of Paderborn, Electrical Engineering, Paderborn, Germany*

09.30

ID 72

A degenerate mode magnetic acoustic resonator

Barry Gallacher¹, Jim Burdess¹, Z Hu¹, Harriet Grigg¹, Carl Dale², Chen Fu², Neil Keegan², John Hedley¹, Julia Spoors²

¹*Newcastle University, Department of Mechanical, Materials and Manufacturing Engineering, Newcastle upon Tyne, United Kingdom*

²*Newcastle University, Institute of Cellular Medicine, Newcastle upon Tyne, United Kingdom*

WEDNESDAY

09.50

ID 517

Uncertainty quantification and response reliability for a nonlinear resonant MEMS t-beam structure undergoing 1:2 autoparametric resonance

Anil K. Bajaj, Rajat Goyal

Purdue University, School of Mechanical Engineering, West Lafayette, USA

10.10

ID 64

Devil's staircase in an optomechanical cavity

Eyal Buks

Technion – Israel Institute of Technology, Electrical Engineering, Haifa, Israel

Room 4 (K134)

08.30 - 10.30

MS 08 / VI.

Nonlinear Phenomena in Mechanical and Structural Systems

Chair:

Jerzy Warmański

Co-chair:

Bala Balachandran

08.30

ID 393

Uncovering detached resonance curves in single degree-of-freedom systems

Giuseppe Habib¹, Giuseppe Cirillo², Gaetan Kerschen³

¹*Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary*

²*University of Cambridge, Department of Engineering, Cambridge, United Kingdom*

³*University of Liege, Aerospace and Mechanical Engineering, Liege, Belgium*

08.50

ID 239

Spectral submanifolds and exact model reduction for nonlinear beam dynamics

Florian Kogelbauer, George Haller

ETH Zürich, Department of Mechanics, Zürich, Switzerland

09.10

ID 325

Bifurcations of relative equilibria sets of a massive point on an uniformly rotating spherical asteroid

Alexander Burov¹, Ivan Kosenko², Ekaterina Shalimova³

¹*Dorodnicyn Computing Centre, Federal Research Center "Computer Science and Control" of Russian Academy of Sciences, Department of Mechanics, Moscow, Russia*

²*Lomonosov Moscow State University, Department of Theoretical Mechanics, Moscow, Russia*

³*Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia*

WEDNESDAY

09.30

ID 452

A modified two-timescale incremental harmonic balance method for steady-state quasi-periodic responses of nonlinear systems

Ren Ju¹, Wei Fan², Weidong Zhu³, Jianliang Huang¹

¹*Sun Yat-sen University, Department of Applied Mechanics, Guangzhou, China*

²*Harbin Institute of Technology, Division of Dynamics and Control, Harbin, China*

³*University of Maryland, Baltimore County, Department of Mechanical Engineering, Baltimore, USA*

09.50

ID 124

The threshold behaviour of chaotization phenomenon for multiple frequency perturbations in a cell

Mikhail Guzev¹, Konstantin Koshel²

¹*Institute for Applied Mathematics Far Eastern Branch Russian Academy of Sciences, Far Eastern Branch Russian Academy of Sciences, Vladivostok, Russia*

²*Pacific Oceanological Institute of FEB RAS, Far Eastern Branch Russian Academy of Sciences, Vladivostok, Russia*

10.10

ID 395

Compensating symmetry breaking in planetary gearboxes by means of tooth profile modifications

Francesco Pellicano, Asma Masoumi, Marco Barbieri

University of Modena and Reggio Emilia, Department of Engineering Enzo Ferrari, Modena, Italy

Room 5 (K150)

08.30 - 10.30

MS 04 / I.

Experiments in Nonlinear Dynamics and Control

Chair:

Hiroshi Yabuno

Co-chair:

Rafael Sanchez Crespo

08.30

ID 17

Model free control of a 2-input and 2-output helicopter system

Ying Xin¹, Zhi-Chang Qin², Wei-Guo Wu¹, Jian-Qiao Sun³

¹*Tianjin University, Department of Mechanics, Tianjin, China*

²*Shandong University of Technology, Department of Mechanics, Zibo, China*

³*University of California, Merced, School of Engineering, Merced, USA*

WEDNESDAY

08.50

ID 31

Chaotic triangle wave generator implementing Chua circuit towards DC/DC converter control

Alexandros Kordonis, Yusuke Nakakohara, Hirotaka Otake

ROHM Co., Ltd., Discrete and Module Production (R&D), Kyoto, Japan

09.10

ID 159

Experimental testing of rotor-stator contact in a coupled double rotor system

Rafael Sanchez Crespo¹, Alexander D. Shaw¹,
Alan R. Champneys²

¹*Swansea University, College of Engineering, Swansea, United Kingdom*

²*University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom*

09.30

ID 303

Measurement of backbone curves of a nonlinear piezoelectric cantilever beam

Vivien Denis¹, Marguerite Jossic², Alexandre Renault¹,
Christophe Giraud-Audine³, Olivier Thomas¹

¹*Arts et Metiers ParisTech, Lille, France*

²*Université Pierre et Marie Curie, Institut JLR d'Alembert UMR CNRS, Paris, France*

³*Arts et Metiers ParisTech, L2EP, Lille, France*

09.50

ID 508

Parametric excitation and detection of electrostatic MEMS actuators

Alaa Elhady¹, Sangtak Park¹, David Effa², Eihab Abdel-Rahman¹,
Mustafa Yavuz²

¹*University of Waterloo, Systems Design Engineering, Waterloo, Canada*

²*University of Waterloo, Mechanical and Mechatronics Engineering, Waterloo, Canada*

10.10

ID 48

Data preparation for execution of experiments on rigid body motion in a resisting medium

Maxim V. Shamolin

Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia

- 08.30 - 10.30** **MS 16 / II.**
Random Dynamical Systems - Recent Advances and New Directions
- Chair:** Daniil Yurchenko **Co-chair:** Radek Erban
- 08.30** **ID 91**
Oscillation patterns in stochastic fast-slow systems
Christian Kuehn
Technical University of Munich, Department of Mathematics, Muenchen, Germany
- 08.50** **ID 441**
Multiscale methods and inverse problems in modelling of intracellular processes
Radek Erban
University of Oxford, Mathematical Institute, Oxford, United Kingdom
- 09.10** **ID 491**
A chaotic linear operator on the space of odd 2π -periodic functions
Márton Kiss¹, Tamás Kalmár-Nagy²
¹*Budapest University of Technology and Economics, Institute for Mathematics, Budapest, Hungary*
²*Budapest University of Technology and Economics, Department of Fluid Mechanics, Budapest, Hungary*
- 09.30** **ID 495**
Advantages of alpha-stable distribution fits for dynamic responses of nonlinear structures subjected to random excitations
Vikram Pakrashi¹, Bidroha Basu²
¹*University College Dublin, Mechanical and Materials Engineering, Dublin, Ireland*
²*Trinity College Dublin, Civil, Structural and Environmental Engineering, Dublin, Ireland*
- 09.50** **ID 523**
Towards a bifurcation theory for random dynamical systems
Jeroen Lamb
Imperial College London, London, United Kingdom
- 10.10** **ID 526**
Hyperbolic periodic orbits in nongradient systems and small-noise-induced metastable transitions
Molei Tao
Georgia Institute of Technology, School of Mathematics, Atlanta, USA

08.30 - 10.30 MS 14 / I.
Nonlinear Dynamics for Engineering Design

Chair:
Stefano Lenci

Co-chair:
Carlos Mazzilli

08.30 ID 30
Asynchronous modes of vibration in a heavy-chain model with linear and rotational springs
Carlos Mazzilli¹, Stefano Lenci²

¹*Universidade de São Paulo, Departamento de Engenharia de Estruturas e Geotécnica, São Paulo, Brazil*

²*Università Politecnica delle Marche, Dipartimento di Ingegneria Civile, Edile e Architettura, Ancona, Italy*

08.50 ID 121
Seismic performance of base-isolated structures based on the force analogy method

Jiting Qu, Wenqi Fang

Dalian University of Technology, Department of Civil Engineering, Dalian, China

09.10 ID 137
Fundamental study on dynamic property of scissoring bridge for disaster relief

Yuki Chikahiro¹, Ario Ichiro², Adachi Kotaro², Shimizu Shigeru¹, Zenzai Seiya¹, Piotr Pawlowski³, Graczykowski Cezary³, Holnicki-Szulc Jan³

¹*Shinshu University, Department of Water Environment & Civil Engineering, Nagano, Japan*

²*Hiroshima University, Department of Civil & Environmental Engineering, Higashi Hiroshima, Japan*

³*Polish Academy of Sciences, Institute of Fundamental Technological Research, Warsaw, Poland*

09.30 ID 243
On the two degrees of freedom oscillator with nonlinear stiffness coupling: theoretical and experiment results
Gianluca Gatti¹, Michael Brennan², Ivana Kovacic³

¹*University of Calabria, Department of Mechanical Energy and Management Engineering, Cosenza, Italy*

²*UNESP, Departamento de Engenharia Mecânica, Ilha Solteira (SP), Brazil*

³*University of Novi Sad, CEVAS, Novi Sad, Serbia*

09.50

ID 315

The NSCD method for dynamic analyses of ancient masonry tower under transversal dynamic loadings

Francesco Clementi, Angela Ferrante, Stefano Lenci

Polytechnic University of Marche, Department of Civil and Building Engineering and Architecture, Ancona, Italy

10.10

ID 509

Seismic damage analysis of a Hungarian historical peasant house archetype

Eduardo Charters Morais

Budapest University of Technology and Economics, Structural Engineering, Budapest, Hungary

Room 9 (KF87)

08.30 - 10.30

MS 20 / I.

Wave Propagation in Mechanical Systems

Chair:

Vassilios Rothos

Co-chair:

Miao Zheng

08.30

ID 53

Solitary waves in dimer binary collision model: a comparative study with granular dimers

Zaid Ahsan¹, K. R Jayaprakash²

¹*University of Illinois at Urbana Champaign, Department of Mechanical Science and Engineering, Champaign, USA*

²*Indian Institute of Technology Gandhinagar, Mechanical Engineering, Gandhinagar, India*

08.50

ID 54

Wave propagation in granular dimers mounted on linear elastic foundation

Zaid Ahsan¹, K. R Jayaprakash²

¹*University of Illinois at Urbana Champaign, Department of Mechanical Science and Engineering, Champaign, USA*

²*Indian Institute of Technology Gandhinagar, Mechanical Engineering, Gandhinagar, India*

09.10

ID 57

Influence of metal internal defect on the propagation of shock wave

Miao Zheng

Institute of Applied Physics and Computational Mathematics, Beijing, China

WEDNESDAY

09.30

ID 68

Numerical investigation of pad or air gap between the high explosive and flyer in impelling

Xin Yu

Institute of Applied Physics and Computational Mathematics, Applied Mechanics, Beijing, China

09.50

ID 209

Wave propagation in nonlinear implicit lattices

Vassilios M. Rothos

Aristotle University, Thessaloniki, Greece, Department of Mechanical Engineering, Thessaloniki, Greece

10.10

ID 364

Parameter sensitivity in experimental wave propagation studies with beam like structures: shadow of chaotic scattering in continuum structural dynamics?

Ioannis Georgiou

National Technical University of Athens, School of Naval Architecture and Marine Engineering, Athens, Greece

10.30 - 11.00

Coffee break

Room 1 (KF51)

11.00 - 12.00

Keynote lecture

Internal resonances in tiny structures: new results and practical applications

Steven Shaw^{1,2}

¹*Department of Mechanical and Aerospace Engineering, Florida Institute of Technology, Melbourne, FL, USA*

²*Departments of Mechanical Engineering and Physics and Astronomy, Michigan State University, East Lansing, MI, USA*

12.00 - 13.30

Lunch break

13.30 - 18.00

Half day excursion

WEDNESDAY

08.30 - 10.30 **MS 21 / I.**
Traffic and Vehicle Dynamics

Chair:
Bart Besselink

Co-chair:
Gábor Orosz

08.30 **ID 309**
Nonlinear analysis of the body sway of car-trailer combinations with nonlinear shock absorber and tire characteristics
Ning Zhang, Jian Ma, Tian Mi, Guo-dong Yin
Southeast University, School of Mechanical Engineering, Nanjing, China

08.50 **ID 334**
The impact of non-smoothness in the tyre-force characteristics on the nonlinear dynamics of towed vehicles
Sandor Beregi, Denes Takacs
Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

09.10 **ID 397**
Robust dynamic vehicle routing for on-demand systems under light load
Hyongju Park¹, Matthew Johnson-Roberson², Ram Vasudevan¹
¹*University of Michigan Ann Arbor, Department of Mechanical Engineering, Ann Arbor, USA*
²*University of Michigan Ann Arbor, Department of Naval Architecture and Marine Engineering, Ann Arbor, USA*

09.30 **ID 446**
Simplified model of rocking suitcases
Hanna Horvath¹, Denes Takacs²
¹*Budapest University of Technology and Economics, Faculty of Mechanical Engineering, Budapest, Hungary*
²*MTA-BME Research Group on Dynamics of Machines and Vehicles, Department of Applied Mechanics, Budapest, Hungary*

09.30 **ID 496**
Analysis of traffic data by considering nonlinearity and nonstationarity
Bidisha Ghosh, Bidroha Basu, Vikram Pakrashi
Trinity College Dublin, Civil, Structural and Environmental Engineering, Dublin, Ireland

10.10

ID 534

New driver assistance functions for commercial vehicles

Peter Frank

*Knorr-Bremse Commercial Vehicle Systems, Research & Development Center,
Budapest, Hungary*

Note that the afternoon session of MS 21 will be held
in [Room 9 \(KF87\)](#).

Room 3 (K155)

08.30 - 10.30

MS 12 / II.

Micro- and Nano-Electro-Mechanical Systems

Chair:

E.M. Abdel-Raman

Co-chair:

Dmitrii Skubov

08.30

ID 403

Equilibrium forms bifurcation of the nonlinear NEMS/MEMS

Dmitrii Skubov¹, Dmitrii Indeitsev¹, Lev Shtukin¹, Alexey Lukin²,
Ivan Popov²

*¹Institute of Problems of Mechanical Engineering Russian Academy of Sciences,
Applied Mathematics, Saint Petersburg, Russia*

*²St. Petersburg Polytechnic University, Department of Mechanical
and Process Engineering, Saint Petersburg, Russia*

08.50

ID 77

Analysis of a simplified MEMS oscillator

Richard Rand¹, Alan Zehnder², B Shayak²

*¹Cornell University, Department of Mathematics and Department of Mechanical
and Aerospace Engineering, Ithaca, USA*

²Cornell University, Department of Mechanical and Aerospace Engineering, Ithaca, USA

09.10

ID 114

Dynamic release condition for latched curved micro beams

Lior Medina¹, Rivka Gilat², Slava Krylov³

¹Tel Aviv University, Faculty of Mechanical Engineering, Tel Aviv, Israel

²Faculty of Engineering, Ariel University, Department of Civil Engineering, Ariel, Israel

³Tel Aviv University, School of Mechanical Engineering, Tel Aviv, Israel

09.30

ID 233

Nonlinear dynamics of microplate-based imperfect MEMS

Mergen Ghayesh¹, Hamed Farokhi²

¹University of Adelaide, School of Mechanical Engineering, Adelaide, Australia

²McGill University, Mechanical Engineering, Montreal, Canada

THURSDAY

09.50 **ID 81**
Pull-in instability of a typical electrostatic MEMS resonator and its suppression by a delayed position feedback
Shang Huilin
Shanghai Institute of Technology, School of Mechanical Engineering, Shanghai, China

10.10 **ID 228**
Simulations in nonlinear behavior of an electrostatically-actuated corrugated diaphragm in microelectromechanical system tunable filters
Yu-Chiao Wu, Dimitrios Peroulis
Purdue University, Birck Nanotechnology Center, Indiana, USA

Room 4 (K134)

08.30 - 10.30 **MS 05 / I.**
Slow-Fast Systems and Phenomena

Chair:
Jon Juel Thomsen

Co-chair:
D. Dane Quinn

08.30 **ID 92**
Non-hyperbolic singularities in fast-slow chemical oscillators
Christian Kuehn
Technical University of Munich, Department of Mathematics, Muenchen, Germany

08.50 **ID 246**
Effect of periodic chip formation on the stability of turning processes
Gergely Gyebrószki¹, Daniel Bachrathy¹, Gábor Csernák², Gabor Stepan¹
¹*Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary*
²*MTA-BME Research Group on Dynamics of Machines and Vehicles, Budapest, Hungary*

09.10 **ID 322**
Interacting global and slow manifolds
Jose Mujica, Bernd Krauskopf, Hinke Osinga
University of Auckland, Department of Mathematics, Auckland, New Zealand

09.30 **ID 502**
Dynamics of a small stiff spherical particle in an acoustic standing wave in fluid
Vladimir Vanovskiy¹, Alexander Petrov²
¹*Moscow Institute of Physics and Technology (MIPT), Department of General Physics, Dolgoprudny, Russia*
²*Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Mechanics of Systems, Moscow, Russia*

THURSDAY

09.50

ID 471

Convergence of equation-free methods in the case of finite time scale separation with applications to deterministic and stochastic systems

Jan Sieber¹, Christian Marschler², Jens Starke³

¹University of Exeter, College of Engineering, Mathematics and Physical Sciences, Exeter, United Kingdom

²Technical University of Denmark, Department of Mathematics and Computer Science, Lyngby, Denmark

³University of Rostock, Institute for Mathematics, Rostock, Germany

Room 5 (K150)

08.30 - 10.30

MS 04 / II.

Experiments in Nonlinear Dynamics and Control

Chair:

Hiroshi Yabuno

Co-chair:

Fabian Schnelle

08.30

ID 104

Experiments on adaptive nonlinear model predictive control of a pendulum

Fabian Schnelle, Peter Eberhard

University of Stuttgart, Institute of Engineering and Computational Mechanics, Stuttgart, Germany

08.50

ID 185

Experimental characterisation of tape spring nonlinear compliant mechanisms

Florence Dewalque¹, Cédric Schwartz², Vincent Denoël², Jean-Louis Croisier², Bénédicte Forthomme², Olivier Brûls¹

¹University of Liege, Department of Aerospace and Mechanical Engineering, Liege, Belgium

²University of Liege, Laboratory of Human Motion Analysis, Liege, Belgium

09.10

ID 404

Nonlinear characteristics of hunting motion of a railway wheel set by using a roller rig

Weiyan Wei

University of Tsukuba, School of Mechanical and Systems Engineering, Tsukuba, Japan

09.30

ID 522

Dynamical response identification of a class of nonlinear hysteretic systems

Biagio Carboni¹, Walter Lacarbonara¹, Patrick Brewick², Sami Masri²

¹Sapienza University di Roma, Department of Structural and Geotechnical Engineering, Rome, Italy

²University of Southern California, Department of Civil and Environmental Engineering, Los Angeles, USA

THURSDAY

09.50

ID 142

Stabilization control for self-excited oscillation of cantilevered fluid-conveying pipe

Beiming Yu

University of Tsukuba, School of Mechanical and Systems Engineering, Tsukuba, Japan

Room 6 (KF81)

08.30 - 10.30

MS 17 / I.

Time-periodic systems

Chair:

Subhash C. Sinha

Co-chair:

Miguel Barrios

08.30

ID 88

A feasible analysis of quasi-periodic Mathieu equations via Floquet theory Part I.

Ashu Sharma, Subhash Sinha

Auburn University, Department of Mechanical Engineering, Auburn, USA

08.50

ID 88

A feasible analysis of quasi-periodic Mathieu equations via Floquet theory Part II.

Ashu Sharma, Subhash Sinha

Auburn University, Department of Mechanical Engineering, Auburn, USA

09.10

ID 112

Hopf bifurcation in a delayed nonlinear Mathieu equation

Alexander Bernstein¹, Si Mohamed Sah², Robert Meller³, Richard Rand⁴

¹*Cornell University, Center for Applied Mathematics, Ithaca, USA*

²*KTH Royal Institute of Technology, Nanostructure Physics, Stockholm, Sweden*

³*Cornell University, Department of Physics, Ithaca, USA*

⁴*Cornell University, Department of Mathematics and Department of Mechanical and Aerospace Engineering, Ithaca, USA*

09.30

ID 126

On the analysis of quasi-periodic systems and a novel “deterministic” explanation of the stochastic resonance phenomenon

Iliya Blekhman¹, Vladislav Sorokin²

¹*Institute of Problems of Mechanical Engineering Russian Academy of Sciences, Vibromechanics, Saint Petersburg, Russia*

²*University of Auckland, Department of Mechanical Engineering, Auckland, New Zealand*

THURSDAY

09.50

ID 532

Minimum damping needed for vanishing an unstable pocket of a Hill equation

Carlos Franco Tello, Joaquín Collado M.,
Miguel Luis Ramirez Barrios

CINVESTAV, Department of Automatic Control, Mexico City, Mexico

10.10

ID 307

Damped Hill's Equation and its application to attenuate vibrations

Miguel Luis Ramirez Barrios, Joaquín Collado

CINVESTAV, Department of Automatic Control, Mexico City, Mexico

Room 7 (KF88)

08.30 - 10.30

MS 14 / II.

Nonlinear Dynamics for Engineering Design

Chair:

Marco Amabili

Co-chair:

Enrico Babilio

08.30

ID 49

An anisometric dynamical integrity measure and its seamless variation with respect to other measures

Pierpaolo Belardinelli¹, Stefano Lenci², Giuseppe Rega³

¹*Delft University of Technology, Precision and Microsystem Engineering, Delft, The Netherlands*

²*Polytechnic University of Marche, Department of Civil and Building Engineering and Architecture, Ancona, Italy*

³*Sapienza University di Roma, Department of Structural and Geotechnical Engineering, Rome, Italy*

08.50

ID 175

Hydrodynamics and stochastic dynamics of a parametric pendulum wave energy converter

Daniil Yurchenko¹, David Forehand², Ciaran Gilbert³,
Athanasios Giannenas¹, Panagiotis Alevras⁴

¹*Heriot-Watt University, Institute of Mechanical, Process and Energy Engineering, Edinburgh, United Kingdom*

²*University of Edinburgh, College of Engineering, Edinburgh, United Kingdom*

³*Strathclyde University, College of Engineering, Glasgow, United Kingdom*

⁴*Loughborough University, School of Mechanical, Electrical and Manufacturing Engineering, Loughborough, United Kingdom*

THURSDAY

09.10

ID 182

A nonlinear model for design of beams operating in largely deformed configurations

Enrico Babilio¹, Stefano Lenci²

¹University of Naples 'Federico II', Department of Structures for Engineering and Architecture (DiSt), Naples, Italy

²Polytechnic University of Marche, Department of Civil and Building Engineering and Architecture, Ancona, Italy

09.30

ID 270

Effect of gravity on the nonlinear dynamics of an overhung rotor with annular rubs

Elijah. T Chipato, A. D Shaw, M. I Friswell

Swansea University, College of Engineering, Swansea, United Kingdom

09.50

ID 484

Parametric study of the force acting on a target during an aircraft impact

Lili Eszter Laczák¹, György Károlyi²

¹Budapest University of Technology and Economics,

Department of Structural Engineering, Budapest, Hungary

²Budapest University of Technology and Economics, Institute of Nuclear Techniques, Budapest, Hungary

Room 8 (KF82)

08.30 - 10.30

MS 15 / I.

Energy Transfer and Harvesting in Nonlinear Systems

Chair:

Oleg Gendelman

Co-chair:

Sandra Chiacchiari

08.30

ID 467

Mitigating tsunamis via nonlinear triad resonance

Usama Kadri

Cardiff University, School of Mathematics, Cardiff, United Kingdom

08.50

ID 39

Energy exchanges in a system of a forced linear structure coupled to a chain of nonlinear oscillators

Simon Charlemagne, Alireza Ture Savadkoohi,
Claude-Henri Lamarque

ENTPE (Ecole Nationale des Travaux Publics de l'Etat), LTDS UMR CNRS 5513,
Vaulx-en-Velin, France

THURSDAY

- 09.10 ID 79**
Front propagation in bi-stable non-degenerate systems: model dependence and universality
 Itzhak Shiroky, Oleg Gendelman
Technion – Israel Institute of Technology, Department of Mechanical Engineering, Haifa, Israel
- 09.30 ID 464**
Passive vibration control with a bistable nonlinear absorber
 Volodymyr Iurasov¹, Pierre-Olivier Mattei²
¹Aix-Marseille University, CNRS, Centrale Marseille, LMA, Marseille, France
²LMA (CNRS, UPR 7051), LMA, Marseille, France
- 09.50 ID 501**
Extreme response mitigation of stochastically forced nonlinear structures
 Themistoklis Sapsis
Massachusetts Institute of Technology, Mechanical Engineering, Cambridge, United States of America
- 10.10 ID 340**
Vibration-based energy harvesting via a bistable system: experimental study
 Sandra Chiacchiari¹, Francesco Romeo¹, Michael McFarland², Lawrence A Bergman², Alexander F Vakakis²
¹Sapienza University of Rome, Dipartimento di Ingegneria Strutturale e Geotecnica, Rome, Italy
²University of Illinois at Urbana-Champaign, College of Engineering, Urbana, USA

Room 9 (KF87)

- 08.30 - 10.30 MS 20 / II.**
Wave Propagation in Mechanical Systems
- Chair:** Francesco Romeo
Co-chair: Ada Amendola
- 08.30 ID 199**
Symmetry-induced dynamic localization in lattice structures
 Nathan Perchikov, Oleg V. Gendelman
Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

08.50

ID 210

Variety of interfacial patterns in miscible fluids induced by vibrations

Yuri Gaponenko, Viktor Yasnou, Aliaksandr Mialdun, Valentina Shevtsova

Université Libre de Bruxelles, Microgravity Research Center, Brussels, Belgium

09.10

ID 486

Stability of capillary waves of finite amplitude

Mariana Lopushanski¹, Alexander Petrov²

¹*Moscow Institute of Physics and Technology (MIPT), Higher Mathematics Department, Moscow, Russia*

²*Institute for Problems in Mechanics, Russian Academy of Sciences, Laboratory of Mechanics of Systems, Moscow, Russia*

09.30

ID 122

On the nonlinear wave dynamics of tensegrity columns

Ada Amendola¹, Gerardo Carpentieri¹, Chiara Daraio², Fernando Fraternali³

¹*University of Salerno, Department of Civil Engineering, Fisciano (SA), Italy*

²*California Institute of Technology, Engineering and Applied Science, Pasadena, California, USA*

³*University of Salerno, Department of Civil Engineering, Fisciano (SA), California, USA*

09.50

ID 356

A numerical study of elastic Fano resonances in degeneracy-broken trapped mode resonators for biosensing applications

Harriet Grigg¹, Barry Gallacher¹, Carl Dale², Nathan Craig¹

¹*Newcastle University, School of Mechanical and Systems Engineering, Newcastle upon Tyne, United Kingdom*

²*Newcastle University, Institute of Cellular Medicine, Newcastle upon Tyne, United Kingdom*

10.10

ID 533

Thermalization of a coupled oscillator chain

Giovanni Salesi, Marta Greselin

University of Bergamo, Dipartimento di Ingegneria e Scienze Applicate, Dalmine, Italy

10.30 - 11.00

Coffee break

THURSDAY

Room 1 (KF51)

11.00 - 12.00 **Keynote lecture**

Tailoring nonlinearity for advanced engineering design: linearization, optimization and practical realization

Gaëtan Kerschen

Space Structures and Systems Laboratory, Aerospace and Mechanical Engineering Department, University of Liège, Belgium

12.00 - 13.30 **Lunch break**

Room 3 (K155)

13.30 - 15.30 **MS 12 / III.
Micro- and Nano-Electro-Mechanical Systems**

Chair:

Slava Krilov

Co-chair:

Sebastien Baquet

13.30

ID 250

Effect of geometric and material nonlinearities on the dynamic behaviour of PMUTs

Ajay Dangi¹, Rudra Pratap²

¹*Indian Institute of Science, Mechanical Engineering, Bangalore, India*

²*Indian Institute of Science, Centre for Nano Science and Engineering, Bangalore, India*

13.50

ID 254

Reduction of amplitude fluctuations in synchronized MEMS-based oscillators

Martial Defoort¹, Oriel Shoshani², Steven Shaw³, David Horsley¹

¹*University of California Davis, Department of Mechanical and Aerospace Engineering, Davis, USA*

²*Ben-Gurion University of the Negev, Department of Mechanical Engineering, Beer-Sheva, Israel*

³*Florida Institute of Technology, Department of Mechanical and Aerospace Engineering, Melbourne, USA*

14.10

ID 257

Three to one internal resonance of modes with different decay rates

Oriel Shoshani¹, Steven Shaw², Mark Dykman³

¹*Ben-Gurion University of the Negev, Department of Mechanical Engineering, Beer-Sheva, Israel*

²*Florida Institute of Technology, Department of Mechanical and Aerospace Engineering, Melbourne, USA*

³*Michigan State University, Department of Physics and Astronomy, East Lansing, USA*

14.30

ID 271

Mass detection through parametric analysis and symmetry-breaking in a MEMS array

Clément Grenat¹, Van-Nghi Nguyen¹, Sébastien Baguet¹, Régis Dufour¹, Claude Henri Lamarque²

¹*INSA Lyon, LaMCoS CNRS UMR5259, Villeurbanne, France*

²*ENTPE, LTDS UMR CNRS 5513, Vaulx-en-Velin, France*

14.50

ID 302

Non-linear dynamics of opto-thermally excited atomically thin graphene resonators

Robin Dolleman¹, Farbod Alijani², Herre Van der Zant¹, Peter Steeneken¹

¹*Delft University of Technology, Kavli Institute of Nanoscience, Delft, The Netherlands*

²*Delft University of Technology, Precision and Microsystem Engineering, Delft, The Netherlands*

15.10

ID 311

Bistability of a cantilever actuated by fringing electrostatic fields

Naftaly Krakover, Slava Krylov

Tel Aviv University, School of Mechanical Engineering, Tel Aviv, Israel

Room 4 (K134)

13.30 - 15.30

MS 05 / II.

Slow-Fast Systems and Phenomena

Chair:

D. Dane Quinn

Co-chair:

Jon Juel Thomsen

13.30

ID 161

Dynamic bifurcations in slow-fast system of neuronal excitability

Vladimir Nekorkin, Sergey Kirillov

Institute of Applied Physics of the Russian Academy of Science, Nonlinear dynamics, Nizhni Novgorod, Russia

THURSDAY

- 13.50 ID 291**
Multi-scale dynamics in microstructures
 Annalisa Iorio¹, Christian Kuehn², Peter Szmolyan¹
¹Vienna University of Technology, Department of Mathematics, Vienna, Austria
²Technical University of Munich, Faculty of Mathematics, Munich, Germany
- 14.10 ID 262**
The Painlevé paradox and blowup - Part I
 Kristian Uldall Kristiansen
 Technical University of Denmark, Applied Mathematics, Copenhagen, Denmark
- 14.30 ID 482**
The Painlevé paradox and blowup - Part II
 John Hogan
 University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom
- 14.50 ID 506**
Slow-fast Hamiltonian systems: dynamics and bifurcations
 Lev Lerman
 Lobachevsky State University of Nizhni Novgorod, Department of Differential Equations, Nizhni Novgorod, Russia

Room 5 (K150)

- 13.30 - 15.30 MS 04 / III.**
Experiments in Nonlinear Dynamics and Control
- Chair:** Guilhem Michon
Co-chair: Shinichi Maruyama
- 13.30 ID 162**
Experimental tracking of limit-point bifurcations using control-based continuation
 Ludovic Renson, D.A.W Barton, Simon Neild Neild
 University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom
- 13.50 ID 264**
Experiments and analysis on nonlinear vibrations of a post-buckled stepped beam
 Shinichi Maruyama, Motofumi Hachisu, Ken-ichi Nagai, Takao Yamaguchi
 Gunma University, Department of Mechanical Science and Technology, Kiryu, Japan
- 14.10 ID 299**
Numerical continuation for edge following in tactile robotics
 David Barton
 University of Bristol, Department of Engineering Mathematics, Bristol, United Kingdom

THURSDAY

14.30

ID 351

Nonlinear system identification of a beam with magnetic restoring forces

Gleb Kleyma, Sebastian Schwarzendahl, Jörg Wallaschek

*Institute of Dynamics and Vibration Research, Leibniz Universität Hannover,
Department of Mechanical Engineering, Hannover, Germany*

14.50

ID 478

Vibration-based testing of bolted joints

Jon Thomsen¹, Si Mohamed Sah¹, Alexander Fidlin²,
Dmitri Tcherniak³

¹*Technical University of Denmark, Department of Mechanical Engineering,
Kgs. Lyngby, Denmark*

²*Karlsruhe Institute of Technology, Department of Engineering Mechanics,
Karlsruhe, Germany*

³*Brüel & Kjær (Sound and Vibration Measurement), Innovation Department,
Nærum, Denmark*

15.10

ID 406

Experimental analysis of a rotor system with two-phase flow squeeze film dampers under low supply pressure

Bingbing Han, Qian Ding, Wei Zhang, Liqing Li, Shengbo Fan

Tianjin University, Department of Mechanics, Tianjin, China

Room 6 (KF81)

13.30 - 15.30

MS 17 / II.

Time-periodic systems

Chair:

Thomas Pumhössel

Co-chair:

Tamas Kalmar-Nagy

13.30

ID 24

Large time-periodic systems in engineering applications

Peter Hagedorn, Artem Karev

*Technische Universität Darmstadt, Mechanical Engineering Department,
Darmstadt, Germany*

13.50

ID 86

On the influence of contact compliance and stiction on vibrational smoothing of dry friction

Simon Kapelke, Wolfgang Seemann

*Karlsruhe Institute of Technology, Institute of Engineering Mechanics,
Karlsruhe, Germany*

THURSDAY

14.10

ID 260

**Impulsive damping of mechanical systems:
periodic solutions and energy harvesting**

Thomas Pumhössel¹, Maryam Ghandchi-Tehrani²

¹*Institute of Mechatronic Design and Production, Johannes Kepler University Linz,
Austria, Faculty of Engineering and Natural Sciences, Linz, Austria*

²*Institute of Sound and Vibration Research, University of Southampton,
Faculty of Engineering and Environment, Southampton, United Kingdom*

14.30

ID 361

**Stability and control of the fractional damped delayed
mathieu equation**

Eric Butcher, Arman Dabiri

University of Arizona, Aerospace and Mechanical Engineering, Tucson, USA

14.50

ID 375

Stability of amplitude chimeras in oscillator networks

Eckehard Schöll

Technische Universität Berlin, Physics, Berlin, Germany

15.10

ID 184

Modal analysis of structures in periodic states

Barend Bentvelsen, Arnaud Lazarus

*CNRS - Université Pierre et Marie Curie, Department of Engineering Mechanics,
Paris, France*

Room 7 (KF88)

13.30 - 15.30

MS 14 / III.

Nonlinear Dynamics for Engineering Design

Chair:

Lidiya Kurpa

Co-chair:

Ivana Kovacic

13.30

ID 70

**Nonlinear vibrations of functionally graded shallow shells
of a complex planform in thermal environments**

Jan Awrejcewicz¹, Lidiya Kurpa², Tatiana Shmatko³

¹*Lodz University of Technology, Department of Automation,
Biomechanics and Mechatronics, Lodz, Poland*

²*National Technical University "KhPI", Department of Applied Mathematics,
Kharkov, Ukraine*

³*National Technical University "KhPI", Department of Higher Mathematics,
Kharkov, Ukraine*

THURSDAY

13.50

ID 102

Nonlinear dynamics of a fluid-filled hollow microcantilever subjected to flowing particles

Farbod Alijani, Pierpaolo Belardinelli, Murali Ghatkesar

*Delft University of Technology, Department of Mechanical,
Materials and Manufacturing Engineering, Delft, The Netherlands*

14.10

ID 154

Numerical analysis of a non-linear energy sink (NES) for the parametric excitation of a submerged cylinder

Guilherme Rosa Franzini, Beatriz Sayuri Sato,
Giovanna Ribeiro Campedelli

*University of São Paulo, Department of Structural and Geotechnical Engineering,
São Paulo, Brazil*

14.30

ID 172

Non-linear dynamics for contactless characterization of graphene

Farbod Alijani¹, Dejan Davidovikj², Marco Amabili³,
Peter G. Steeneken¹

¹*Delft University of Technology, Precision and Microsystem Engineering,
Delft, The Netherlands*

²*Delft University of Technology, Nanostructure Physics, Delft, The Netherlands*

³*McGill University, Department of Mechanical Engineering, Montreal, Canada*

14.50

ID 207

Sympodial fractal structures: tree-inspired concept for biomimetic engineering design

Ivana Kovacic¹, Dragi Radomirovic², Dusan Arsic³,
Miodrag Zukovic¹

¹*University of Novi Sad, CEVAS, Novi Sad, Serbia*

²*University of Novi Sad, Faculty of Agriculture, Novi Sad, Serbia*

³*University of Novi Sad, Faculty of Technical Sciences, Novi Sad, Serbia*

15.10

ID 219

Analysis of non-linear dynamic behaviours in asphalt concrete pavements under temperature variations

Amal Abdelaziz, Chun-Hsing Ho, Junyi Shan

Northern Arizona University, College of Engineering, Flagstaff, USA

Room 8 (KF82)

13.30 - 15.30

MS 15 / II.

Energy Transfer and Harvesting in Nonlinear Systems

Chair:

Oleg Gendelman

Co-chair:

Yuri Sudenkov

THURSDAY

13.30

ID 56

Analytical solution for energy harvesting from nonlinear transverse vibration of an asymmetric bimorph piezoelectric plate

Hamed Shorakaei¹, Alireza Shooshtari¹, Giuseppe Rega²

¹Bu-Ali Sina University, Department of Mechanical Engineering, Hamedan, Iran

²Sapienza University of Rome, Department of Structural and Geotechnical Engineering, Rome, Italy

13.50

ID 74

Energy exchange and localization in essentially nonlinear oscillatory systems: canonical formalism.

Oleg Gendelman¹, Themistoklis Sapsis²

¹Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

²Massachusetts Institute of Technology, Department of Mechanical Engineering, Boston, USA

14.10

ID 127

Nonequilibrium response of solids to thermal and mechanical perturbances of submicro and nanosecond duration

Yuri Sudenkov¹, Vera Sventitskaya², Boris Zimin³

¹St.Petersburg State University, Department of Mechanics, St.Petersburg, Russia

²BSTU "VOENMEH", Department of Mathematics, St.Petersburg, Russia

³Institute of Problems of Mechanical Engineering, Department of Mechanics, St.Petersburg, Russia

14.30

ID 139

Three-dimensional energy channeling in unit-cell model coupled to a spherical rotator

Jayaprakash K. R.¹, Yuli Starosvetsky²

¹Indian Institute of Technology Gandhinagar, Mechanical Engineering, Gandhinagar, India

²Technion – Israel Institute of Technology, Faculty of Mechanical Engineering, Haifa, Israel

14.50

ID 295

Passive realization of a nonlinear piezoelectric tuned vibration absorber with a saturable inductor

Boris Lossouarn¹, Jean-François Deü², Gaetan Kerschen¹

¹University of Liege, Department of Aerospace and Mechanical Engineering, Liege, Belgium

²Conservatoire national des arts et métiers, Structural Mechanics and Coupled Systems Laboratory, Paris, France

15.10

ID 224

Numerical studies on piezoelectric energy harvesting from vortex-induced vibrations considering cross-wise and in-line oscillations

Lucas Oliveira Bunzel, Guilherme Rosa Franzini

University of São Paulo, Department of Structural and Geotechnical Engineering, São Paulo, Brazil

THURSDAY

13.30 - 15.30 MS 21 / II.
Traffic and Vehicle Dynamics

Chair:
Gábor Orosz

Co-chair:
Bart Besselink

- 13.30 ID 93**
Cooperative intersection automation using virtual platoons
Alejandro Ivan Morales Medina, Nathan Van de Wouw,
Henk Nijmeijer
*Eindhoven University of Technology, Department of Mechanical Engineering,
Eindhoven, The Netherlands*
- 13.50 ID 230**
String stability for cascaded systems subject to disturbances
Bart Besselink¹, Karl H. Johansson²
¹*University of Groningen, Johann Bernoulli Institute for Mathematics and Computer
Science, Groningen, The Netherlands*
²*KTH Royal Institute of Technology, Department of Automatic Control,
Stockholm, Sweden*
- 14.10 ID 247**
**Nonlinear traffic modeling for urban road network
and related robust state estimation**
Tamás Tettamanti, Márton Tamás Horváth, István Varga
*Budapest University of Technology and Economics,
Department of Control for Transportation and Vehicle Systems, Budapest, Hungary*
- 14.30 ID 398**
Artificial potential functions for control of automated vehicles
Elham Semsar-kazerooni¹, Jeroen Ploeg¹, Koos Elferink²,
Henk Nijmeijer²
¹*TNO, Integrated vehicle safety, Helmond, The Netherlands*
²*Eindhoven University of Technology, Mechanical Engineering,
Eindhoven, The Netherlands*
- 14.50 ID 504**
**Nonholonomic lane change maneuvers for connected
and autonomous vehicles**
Gábor Orosz, Yiming Zhang, Wubing Qin, Chaozhe He,
Avedisov Sergei
*University of Michigan Ann Arbor, Department of Mechanical Engineering,
Ann Arbor, USA*

Room 1 (KF51)

16:00 - 18:00 Poster session

ID 11

Pulses and snakes in the Ginzburg–Landau equation

Stefan Mancas¹, Roy Choudhury²

¹Embry-Riddle Aeronautical University, Department of Mathematics, Daytona Beach, USA

²Univ. of Central Florida, Department of Mathematics, Orlando, USA

ID 12

Competitive modes as reliable predictors of chaos versus hyperchaos and as geometric mappings accurately delimiting attractors

Marianna Pensky, Roy Choudhury

Univ. of Central Florida, Department of Mathematics, Orlando, USA

ID 21

Modified statistical linearization for analysing chaotic parametric space of weak-noise excited Duffing oscillator

Ren-Jung Chang, Jun-Fu Liu, Cheng-Tang Fan

National Cheng Kung University, Mechanical Engineering Department, Tainan, Taiwan

ID 23

Resonance phenomena in a two-layer shear flow interacting with two vortices in bottom layer

Eugene Ryzhov, Konstantin Koshel

Pacific Oceanological Institute of FEB RAS, Geophysical Hydrodynamics,

Vladivostok, Russia

ID 27

Binary gas mixture in a high-speed channel

Sahadev Pradhan

Department of Chemical Engineering, Indian Institute of Science,

Department of Chemical Engineering, Bangalore, India

ID 41

Non-linear dynamics of an Disc Brake System under Moving Loads

Qian Ding, Xin Sui

Tianjin University, Department of Mechanics, Tianjin, China

ID 43

Dynamic analysis of a flexible manipulator with embedded PZT actuators based on FE method

Shao Minqiang

*Nanjing University of Aeronautics and Astronautics, College of Aerospace Engineering,
Nanjing, China*

ID 47

Using a robust torus to control chaos in low density beams

Meirielen De Sousa, Iberê Caldas

University of São Paulo, Institute of Physics, São Paulo, Brazil

ID 103

Application of the time-fractional diffusion equation to describing the methanol transport in the catalyst grain for methanol-to-olefin reaction

Alexey Zhokh, Peter Strizhak

*National Academy of Sciences of Ukraine, Pisarzhevsky Institute of Physical Chemistry,
Kiev, Ukraine*

ID 130

Long-term stochastic stability of locally stable dynamical systems with respect to white noise

Oskar Sultanov

*Institute of Mathematics, Ufa Scientific Center, Russian Academy of Sciences,
Department of Differential Equations, Ufa, Russia*

ID 155

Performance analysis of a CFRP reinforced concrete slab under a transient dynamic loading

Lihua Huang, Yuanyuan Dong

Dalian University of Technology, Faculty of Infrastructural Engineering, Dalian, China

ID 170

Nonlinear dynamics of a functionally graded nonlocal nanobeam in thermal environment by using incremental harmonic balance and Melnikov method

Danilo Karličić, Milan Cajić

*Mathematical Institute of Serbian Academy of Sciences and Arts,
Department of Mechanics, Belgrade, Serbia*

ID 189

Quantifying dynamics of force networks in dense particulate matter using topological measures

Lou Kondic¹, Lenka Kovalcinova¹, Miro Kramar²,
Konstantin Mischaikow³

¹New Jersey Institute of Technology, Department of Mathematical Sciences, Newark, USA

²Tohoku University, Hiraoka Laboratory, Sendai, Japan

³Rutgers University, Department of Mathematics, Piscataway, USA

ID 214

Integral representation of fractional Euler-Lagrange equation with mixed boundary conditions

Mariusz Ciesielski¹, Tomasz Blaszczyk², Jaroslaw Siedlecki²

¹Institute of Computer and Information Sciences, Czestochowa University of Technology, Czestochowa, Poland

²Institute of Mathematics, Czestochowa University of Technology, Czestochowa, Poland

ID 215

Imitation of synaptic coupling of electronic neurons by memristive device

Svetlana Gerasimova¹, Alexey Mikhaylov², Alexey Belov²,
Dmitry Korolev², Victor Kazantsev¹

¹Lobachevsky State University of Nizhni Novgorod, Institute of Biology and Biomedicine, Nizhni Novgorod, Russia

²Lobachevsky State University of Nizhni Novgorod, Research Institute of Physics and Technology, Nizhni Novgorod, Russia

ID 231

Nonlinear dynamical response of fluid conveyed thin-walled piezoelectric cylindrical shell

Alireza Shooshtari, Vahid Atabakhshian

Bu-Ali Sina University, Department of Mechanical Engineering, Hamedan, Iran

ID 251

Thermodynamical formalism of fractals via Fisher information: Rényi dimensions

Bence Godó

University of Debrecen, Faculty of Science and Technology, Debrecen, Hungary

ID 258

On the trajectory planning for the control of all state variables for torque-unit manipulator

Koji Yoshida

Okayama University of Science, Department of Mechanical Systems Engineering, Okayama, Japan

ID 263

Vibration power flow analysis of typical nonlinear oscillators

Jian Yang

*University of Nottingham Ningbo China, Department of Mechanical,
Materials and Manufacturing Engineering, Ningbo, China*

ID 267

The driven Rayleigh-van der Pol oscillator

René Bartkowiak

University of Rostock, Applied Mechanics, Rostock, Germany

ID 278

Chattering motion of rigid objects

Tamás Baranyai, Péter L. Várkonyi

*Budapest University of Technology and Economics, Department of Mechanics,
Materials and Structures, Budapest, Hungary*

ID 306

**Inclusion–exclusion principle and description of potential
of rigid bodies with irregular mass distribution**

Alexander Burov^{1,3}, Anna Guerman², Vasily Nikonov³,

¹*National Research University “Higher School of Economics”,
Department of Mathematics, Moscow, Russia*

²*University of Beira Interior, Department of Electromechanical Engineering,
Covilha, Portugal*

³*Dorodnicyn Computing Centre, Federal Research Center “Computer Science
and Control” of Russian Academy of Sciences, Department of Mechanics,
Moscow, Russia*

ID 310

Dance-like motions in optimal walking

Ulrich Römer, Alexander Fidlin

Karlsruhe Institute of Technology, Institute of Engineering Mechanics, Karlsruhe, Germany

ID 317

Asymptotic study of the model of a rowing boat

Liubov Klimina¹, Marat Dosaev¹, Rinaldo Garziera²,
Shyh-Shin Hwang³

¹*Lomonosov Moscow State University, Institute of Mechanics, Moscow, Russia*

²*University of Parma, Department of Industrial Engineering, Parma, Italy*

³*Chien Hsin University of Science and Technology, Mechanical Engineering Department,
Taoyuan City, Taiwan*

ID 336

Electronic circuit emulation and numerical simulation of a fractional nonlinear macroeconomic dynamic model

Sergio Adriani David¹, Clovis Fischer¹, Clivaldo Oliveira²

¹Universidade de São Paulo, Department of Biosystems Engineering (ZEB), Pirassununga, Brazil

²Federal University of Grande Dourados, Departamento de Engenharia Mecânica, Dourados, Brazil

ID 341

Power generation of a pendulum energy converter excited by random loads

Leo Dostal, Marc-André Pick

Hamburg University of Technology, Institute of Mechanics and Ocean Engineering, Hamburg, Germany

ID 347

Different models for balancing using accelerometer

András Balázs Kovács, Tamás Insperger

Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

ID 394

An approximation method for solving a class of time-delay systems with constant time-delay

Mengshi Jin, Hanwen Song, Jian Xu

Tongji University, School of Aerospace Engineering and Applied Mechanics, Shanghai, China

ID 409

Entrainment and bifurcation dynamics of a dry friction oscillator

Charles Jacob, Bipin Balam, B. Santhosh

Amrita University, Department of Mechanical Engineering, Coimbatore, India

ID 427

Analysis of the forced vibration of geometrically nonlinear cantilever beam with lumping mass by multiple scale Lindstedt-Poincaré method

Hai-En Du, Guo-Kang Er, Vai Pan lu

University of Macau, Department of Civil and Environmental Engineering, Macau SAR, China

ID 438

Bifurcations of periodic solutions for systems with discontinuities

Jacob Meijaard

Olton Engineering Consultancy, Enschede, The Netherlands

ID 445

Optimal state feedback design with LMI techniques for the torque control of a nonlinear hydrostatic transmission

Harald Aschemann, Robert Prabel

University of Rostock, Faculty of Mechanical Engineering, Rostock, Germany

ID 455

Dynamics of the basketball rolling along the rim

Vince Havas, Mate Antal, Gabor Stepan

Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary

ID 474

Friction dependency of the controllability of rigid bodies in ideal fluids

Sergey M. Ramodanov¹, Alexey A. Kireenkov²

¹*Blagonravov Institute of Machines Science of the Russian Academy of Sciences, Department of Machine Mechanics, Moscow, Russia*

²*Ishlinsky Institute for Problems in Mechanics RAS - Moscow Institute of Physics and Technology (State University), Laboratory of Mechanics of Systems, Department of Higher Mathematics, Moscow - Dolgoprudny, Russia*

ID 475

On the Kukles cubic system

Valery Gaiko

National Academy of Sciences of Belarus, United Institute of Informatics Problems, Minsk, Belarus

ID 494

Proper orthogonal decomposition of delay-differential equations

Balázs Heizer, Tamás Kalmár-Nagy

Budapest University of Technology and Economics, Department of Fluid Mechanics, Budapest, Hungary

ID 516**Non-smooth modelling of a periodic structure with contact-friction and aero-elastic couplings**Miroslav Byrtus¹, Michal Hajzman¹, Ladislav Pust²¹University of West Bohemia, Department of Mechanics, Plzen, Czech Republic²Institute of Thermomechanics AS CR, v.v.i., -, Prague, Czech Republic**ID 519****Generalized time history earthquake record for nonlinear dynamic analysis**

Khaldoon Bani-Hani, Mu'ath Abu Qamar

Jordan University of Science and Technology, Civil,

Structural and Environmental Engineering, Irbid, Jordan

ID 520**Structural and thermal analysis of 3D printing process**Ming-Hisao Lee¹, Shou-I Chen², Keng-Liang Ou³¹National Center for High-performance Computing, Hsinchu, Taiwan²Instrument Technology Research Center, NARL, Hsinchu, Taiwan³Taipei Medical University, School of Dentistry, College of Oral Medicine, Taipei, Taiwan**ID 525****Low-frequency response of controlled systems on a high-frequency parametric excitation**

Eugen Kremer

LuK GmbH & Co.KG, Finite Elements / Dynamics Team, Buehl/Baden, Germany

ID 527**A dynamical model for SIS epidemic propagation on adaptive networks**

Ágnes Bodó, Péter L. Simon

Eötvös Loránd University Budapest, Department of Applied Analysis and Computational

Mathematics, Budapest, Hungary

19.00 - 24.00**Farewell Dinner**

08.30 - 10.30

MS 12 / IV.

Micro- and Nano-Electro-Mechanical Systems

Chair:

Anil Bajaj

Co-chair:

Ashok Kumar Pandey

08.30

ID 320

1:1 Internal resonance of two transverse modes of a microbeam using approximate mode shape

Ashok Kumar Pandey¹, Prashant N. Kambali², Gynadutta Swain³

¹Indian institute of Technology Hyderabad, Mechanical and Aerospace Engineering, Hyderabad, India

²Technion – Israel Institute of Technology, Department of Mechanical Engineering, Haifa, Israel

³Mercedes Benz, Bangalore, India

08.50

ID 329

A multiple scales analysis of very large-scale arrays of globally coupled MEMS resonators

Chaitanya Borra¹, Conor S. Pyles², D. Dane Quinn¹, Jeffrey F. Rhoads²

¹The University of Akron, Department of Mechanical Engineering, Akron, USA

²Purdue University, School of Mechanical Engineering, West Lafayette, USA

09.10

ID 378

Demonstration of electrostatic MEMS bifurcation sensors

Majed Alghamdi¹, Mahmoud Khater², Stewart Katherine³, Ayman Alneamy¹, Ridha Almikhlafi¹, Sangtak Park¹, Eihab Abdel-Rahman¹, Alexander Penlidis³

¹University of Waterloo, Systems Design Engineering, Waterloo, Canada

²KFUPM, Mechanical Department, Dahrn, Saudi Arabia

³University of Waterloo, Chemical Engineering, Waterloo, Canada

09.30

ID 435

Direct and parametric entrainment of a graphene oscillator

Samer Hourri, Santiago Cartamil-Bueno, Menno Poot, Peter Steeneken, Herre Van Der Zant, Warner Venstra

Delft University of Technology, Kavli Institute of Nanoscience, Delft, The Netherlands

08.30 - 10.30 **MS 05 / III.**
Slow-Fast Systems and Phenomena

Chair:
Jon Juel Thomsen

Co-chair:
D. Dane Quinn

08.30 **ID 324**
Twin canards and MMOs in a chemical reaction model
Cris Hasan, Bernd Krauskopf, Hinke Osinga
University of Auckland, Department of Mathematics, Auckland, New Zealand

08.50 **ID 349**
Exact model reduction for a von Kármán beam
Shobhit Jain, George Haller, Paolo Tiso
ETH Zürich, Institute for Mechanical Systems, Zürich, Switzerland

09.10 **ID 421**
**Motion control of a flexible underactuated manipulator
by using high-frequency excitation**
Satoshi Kobayashi, Hiroshi Yabuno
*University of Tsukuba, Graduate School of System and Information Engineering,
Tsukuba, Japan*

09.30 **ID 468**
Faraday waves from acoustic - gravity wave theory
Usama Kadri
Cardiff University, School of Mathematics, Cardiff, United Kingdom

09.50 **ID 528**
**The existence of extremal solutions for a coupled system
of nonlinear fractional integro-differential equations**
Neda Khodabakhshi
*Amirkabir University of Technology, Department of Mathematics and Computer Science,
Tehran, Iran*

08.30 - 10.30 MS 17 / III.
Time-periodic systems

Chair:
Tamas Kalmar-Nagy

Co-chair:
Thomas Pumphössel

08.30 ID 145
Optimal timing control using the augmented phase reduction
Bharat Monga, Jeff Moehlis
*University of California, Santa Barbara, Department of Mechanical Engineering,
Santa Barbara, California, USA*

08.50 ID 488
**Stability and vibration amplitude of the quasi periodic
delayed Mathieu equation with frequency-modulated
coefficients**
Daniel Bachrathy
*Budapest University of Technology and Economics, Department of Applied Mechanics,
Budapest, Hungary*

09.10 ID 212
**Interaction of period-1 orbits in a dual-frequency driven
asymmetric nonlinear oscillator**
Ferenc Hegedűs¹, Werner Lauterborn², Ulrich Parlitz³,
Robert Mettin²
*¹Budapest University of Technology and Economics,
Department of Hydrodynamic Systems, Budapest, Hungary*
²Georg-August-Universität Göttingen, Third Institute of Physics, Göttingen, Germany
*³Max Planck Institute for Dynamics and Self-Organization, Biomedical Physics Group,
Göttingen, Germany*

09.30 ID 225
A discrete predator-prey conflict model with defense term
Markus Messer¹, Joachim Messer²
*¹Technische Hochschule Mittelhessen, Department of Mechanical Engineering,
Friedberg, Germany*
²Justus-Liebig-Universität, Institut für Theoretische Physik, Gießen, Germany

09.50 ID 487
**Linear flows in the rapid distortion limit: dynamical systems
analysis of the Kelvin-Townsend equations**
Tamas Kalmar-Nagy¹, Sharath Girimaji²
*¹Budapest University of Technology and Economics, Department of Fluid Mechanics,
Budapest, Hungary*
²Texas A&M University, Aerospace Engineering, College Station, USA

08.30 - 10.30 MS 14 / IV.
Nonlinear Dynamics for Engineering Design

Chair:
Marco Amabili

Co-chair:
Olivier Thomas

08.30 ID 176
Vibrations of rotating composite blades with embedded nonlinear piezoelectric elements
Jerzy Warminski, Jaroslaw Latajski
Lublin University of Technology, Department of Applied Mechanics, Lublin, Poland

08.50 ID 44
A generalised nonlinear isolator-elastic beam interaction analysis for extremely low or high supporting frequency
Jing Tang Xing¹, Yeping Xiong¹, Kamal Djidjeli²,
Khairiah Kamilah Turahim¹
*¹University of Southampton, Faculty of Engineering and Environment,
Southampton, United Kingdom*
*²Yaroslavl State University, Faculty of Engineering and Environment,
Southampton, United Kingdom*

09.10 ID 277
Maximum vibration amplitude during run-up of a Jeffcott rotor at parametric anti-resonance
Fadi Dohnal
UMIT, Department of Biomedical Informatics and Mechatronics, Lienz, Austria

09.30 ID 346
Direct antiresonance continuation for non linear dynamic absorbers
Olivier Thomas¹, Alexandre Renault¹, Hervé Mahé²
¹Arts et Metiers ParisTech, LSIS UMR CNRS 7296, Lille, France
²Valeo Transmission, Amiens, France

09.50 ID 425
Optimization of planetary gear systems
Marco Barbieri, Asma Masoumi, Francesco Pellicano
*University of Modena and Reggio Emilia, Dipartimento di Ingegneria Enzo Ferrari,
Modena, Italy*

08.30 - 10.30 MS 15 / III.
Energy Transfer and Harvesting in Nonlinear Systems

Chair:
Brian Mann

Co-chair:
Krzysztof Kecik

08.30 ID 512
Parametric resonance of a nonlinear energy harvester for torsional vibrations

Panagiotis Alevras¹, Stephanos Theodossiades¹,
Homer Rahnejat¹, Tim Saunders²

¹Loughborough University, Wolfson School of Mechanical and Manufacturing Engineering,
Loughborough, United Kingdom

²Ford Engineering Research Centre, Dunton, United Kingdom

08.50 ID 211
Energy recovery from a pendulum vibration absorber with a maglev harvester

Krzysztof Kecik¹, Piotr Brzeski², Andrzej Mitura¹,
Przemysław Perlikowski²

¹Lublin University of Technology, Department of Applied Mechanics, Lublin, Poland

²Lodz University of Technology, Division of Dynamics, Lodz, Poland

09.10 ID 297
Nonlinear vibration energy harvesting using piezoelectric tiles placed in stairways

Connor Edlund¹, Subramanian Ramakrishnan²

¹University of Minnesota, Department of Electrical Engineering, Duluth, USA

²University of Minnesota, Department of Mechanical and Industrial Engineering, Duluth, USA

09.30 ID 461
Experimental study of noise reduction using an hybrid electro-acoustic NES

Pierre-Yvon Bryk, Sergio Bellizzi, Renaud Côte

Aix-Marseille University, CNRS, Centrale Marseille, LMA, Marseille, France

09.50 ID 492
Energy harvesting from vortex induced vibration using period-1 rotation of parametric pendulum

Santanu Das, Pankaj Wahi

Indian Institute of Technology Kanpur, Department of Mechanical Engineering, Kanpur, India

10.10

ID 28

Inverse scattering problems for the perturbed biharmonic operator

Valery Serov

University of Oulu, Finland, Department of Mathematics, Oulu, Finland

10.30 - 11.00

Coffee break

Room 1 (KF51)

11.00 - 12.00

Keynote lecture

**Exact model reduction for nonlinear oscillations:
from equations to data sets**

George Haller

Chair in Nonlinear Dynamics, Institute for Mechanical Systems, ETH Zürich

12.00 - 13.00

Closing Ceremony

**Announcement of ENOC 2017 Young Scientist's Prize
and Best Poster Award**

FRIDAY

COMMITTEE MEETINGS

Sunday, 25 June 2017

Room K195

17.00 Meeting of the European Nonlinear Oscillations
Conference Committee (ENOCC)

Thursday, 29 June 2017

Room K195

17.00 Meeting of the European Nonlinear Oscillations
Conference Committee (ENOCC)

Tuesday, 27 June 2017

Editorial meeting of the International Journal of Dynamics and Control

Exact time and venue: TBA

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USEFUL INFORMATION

Climate

The climate of Budapest is continental, at the end of June we expect very hot summer weather with a maximum daily temperature of 28-35 °C. Protect yourself from sunshine and make sure to hydrate regularly.

Time Zone

Central European Summer Time (CEST): UTC+02:00

Insurance

The registration fee does not include provision for the insurance of participants against personal accidents, illness, cancellation, theft, property loss or damage. Participants are advised to take adequate personal travel insurance.

Local currency

The Forint (HUF) is the official national currency in Hungary. The exchange rates may vary in different banks, exchange offices and hotels, the exchange rate is around 1 Euro = 310 HUF. All the major credit cards are accepted in Hungary.

Electricity

The AC electrical network in Hungary operates at 230V, 50 Hz.

Recommended Taxi Company

To reach the hotels or the conference venue and to avoid any inconvenience, organisers recommend to use the City Taxi taxi company: +36 1 211 1111, www.citytaxi.hu. Please note, that all licensed taxi companies have yellow cars and have the same rates, placed clearly visible on the screens.

Parking

If you drive a personal or rented car, always try to park at a guarded parking lot and do not leave any valuables in the car. Please note, that Budapest is divided into parking zones, with one parking meter in each street. The maximum parking time duration is 2 hours, tariffs may vary.

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MAP



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