

Директору Математичког института САНУ
Проф. др Зорану Марковићу
Научном већу Математичког института САНУ

Стручни извештај о учешћу у научним скуповима у 2014 години

IX* The 13th Serbian Mathematical Congress in Vrnjačka Banja, Serbia, from May 22 — 25, 2014.

<http://tesla.pmf.ni.ac.rs/people/smak/index.php>

Саопштење у секцији Applied Mathematics:

Katica (Stevanovic) Hedrih, **Petrovic's Elements of mathematical phenomenology AND Phenomenological Mappings in Science**



X* 8th European Nonlinear Dynamics Conference (ENOC 2014) at the University of Technology in Vienna, Austria, **July 6 - 11, 2014**

<http://enoc2014.conf.tuwien.ac.at/index.php/welcome>

MS09-6: Nonlinear Dynamics of Structural and Machine Elements

Katica (Stevanovic) Hedrih, Andjelka N Hedrih, (2014), Petrović's theory of elements of mathematical phenomenology and phenomenological mapping applied to system nonlinear dynamics, MS09-6: Nonlinear Dynamics of Structural and Machine Elements, [8th European Nonlinear Dynamics Conference](#) - ENOC 2014, July 6-11, 2014, Vienna, Austria, Electronic USB Proceedings,

GT-5: General Track

Katica R. (Stevanović) Hedrih, Julijana Ju Simonović, Ana Ivanović-Šašić, Ljiljana Kolar-Anić, Željko Čupić, Andjelka N. Hedrih, (2014), Elements of mathematical phenomenology and qualitative /mathematical analogies on the basis of generalized Lissajous curves, GT-5: General Track, [8th European Nonlinear Dynamics Conference](#) - ENOC 2014, July 6-11, 2014, Vienna, Austria, Electronic USB Proceedings,

Session

MS09-6: Nonlinear Dynamics of Structural and Machine Elements VI

Time: Thursday, 10/Jul/2014: 10:30am - 12:10pm

Session Chair: K Nakano

Session Chair: Katica R. (Stevanović) Hedrih

Location: HS5

198 Places

Session

GT-5: General Track V

Time: Friday, 11/Jul/2014: 10:30am - 12:10pm
Session Chair: Katica R. (Stevanović) Hedrih
Session Chair: Yuri V. Mikhlin

Location: HS6
198 Places

----- Original Message -----

Subject: ENOC2014
From: "ENOC 2014" <enoc2014@tuwien.ac.at>
Date: Sat, July 5, 2014 9:09 pm
To: khedrih@sbb.rs
Cc: khedrih@sbb.rs

Dear Prof. Katica R. (Stevanović) Hedrih,

we are pleased to inform you that you were selected as moderator / chair
of the following 2 session(s):

Session "Nonlinear Dynamics of Structural and Machine Elements VI"

=====

Time : Thursday, 10/Jul/2014: 10:30am - 12:10pm
Location: HS5
Session Chair: K Nakano; knakano@iis.u-tokyo.ac.jp
Session Chair: Katica R. (Stevanović) Hedrih; khedrih@sbb.rs
http://osiris.tuwien.ac.at/enoc/sessions.php?form_session=7

Presentations

Enhancing vibrational energy harvesting using stochastic resonance within
a bi-stable mechanical system
Author(s): Nakano, Kimihiko; Cartmell, Matthew P; Rencheng, Zheng; Hu,
Honggang; Su, Dongxu
Presenting Author: Nakano, Kimihiko; knakano@iis.u-tokyo.ac.jp

Petrović's theory of elements of mathematical phenomenology and
phenomenological mapping applied to system nonlinear dynamics
Author(s): Hedrih, Katica {Stevanovic}; Hedrih, Andjelka N
Presenting Author: Hedrih, Andjelka N; handjelka@hm.co.rs

Modelling of parametric resonance oscillations by two coupled modes
Author(s): Krasnopolskaya, Tatiana; Spektor, Viacheslav; Prykhodko,
Dmytro; Gourjii, Alexandre

Presenting Author: Krasnopol'skaya, Tatiana; t.krasnopol'skaya@tue.nl

Nonlinear normal modes of vibrating mechanical systems and their applications

Author(s): Mikhlin, Yuri Vladimirovich; Avramov, Konstantin; Pierre, Christophe

Presenting Author: Mikhlin, Yuri Vladimirovich; Yuri_Mikhlin@mail.ru

Session "General Track V"

=====

Time : Friday, 11/Jul/2014: 10:30am - 12:10pm

Location: HS6

Session Chair: Katica R. (Stevanović) Hedrih; khedrih@sbb.rs

Session Chair: Yuri V. Mikhlin; Yuri_Mikhlin@mail.ru

http://osiris.tuwien.ac.at/enoc/sessions.php?form_session=24

Presentations

Moving-load-induced vibration of a multibody beam composed of elastic and rigid beam segments

Author(s): Wu, Jia-Jang

Presenting Author: Wu, Jia-Jang; jjangwu@mail.nkmu.edu.tw

Elements of mathematical phenomenology and qualitative /mathematical analogies on the basis of generalized Lissajous curves

Author(s): Hedrih, Katica R. (Stevanović); Ju Simonović, Julijana; Ivanović-Å aÄjić, Ana; Kolar-Anić, Ljiljana; ÄEupić, Å½eljko; Hedrih, Andjelka N.

Presenting Author: Hedrih, Katica R. (Stevanović); khedrih@sbb.rs

Chaotic dynamics in an Earth pointing, magnetically controlled spacecraft

Author(s): Della Rossa, Fabio; Dercole, Fabio; Lovera, Marco

Presenting Author: Della Rossa, Fabio; fabio.dellarossa@polimi.it

Nonlinear vibration of nonlocal Kelvin-Voigt viscoelastic nanobeam embedded in elastic medium

Author(s): Karlić ić, Danilo Z.; Cajić, Milan S.; Stamenković, Marija

Presenting Author: Karlić ić, Danilo Z.; danilozmaj@gmail.com

Intermittencies in Bray-Liebhafsky reaction system

Author(s): Bubanja, Itana NuÄja; Anić, Slobodan; Milenković, Maja; ÄEupić, Å½eljko; Kolar-Anić, Ljiljana

Presenting Author: Bubanja, Itana NuÄja; itana.bubanja@ffh.bg.ac.rs

Please contact the speakers in your session to inform them about the schedule of the session and their presentation times. Please remember to spare time for questions and for discussion on the session topic with the

attendees.

We have assigned presentation slots of 20 minutes for each speaker, which should ideally consist of 15 minutes talk and 5 minutes discussion. A few presentations are "plenary talks" with 40 minutes presentation time.

In order to make the switching between sessions easy, we kindly ask you to keep the order of presentations and not to fill up withdrawn sessions.

If for some reason you cannot act as chair in a session, please inform us as soon as possible.

Thank you again for your collaboration to the success of the congress.

Horst Ecker, Alois Steindl, and Stefan Jakubek
Your organizers of ENOC2014.

--

ENOC 2014 - 8th European Nonlinear Dynamics Conference

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Subject: ENOC2014: Session chair for General Track

From: "ENOC 2014" <enoc2014@tuwien.ac.at>

Date: Mon, June 16, 2014 11:02 pm

To: khedrih@sbb.rs

Cc: khedrih@eunet.rs

Priority: Normal

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Dear Prof. Katica R. (Stevanović) Hedrih,

we would like to ask you to chair a session for the **General Track** at the conference.

We have already assigned you tentatively as chair of a session. The preliminary program schedule can be viewed at <http://osiris.tuwien.ac.at/enoc/sessions.php>.

If you are not able to chair the session(s), please let us know as soon as possible.

Your contribution to the successful accomplishment of the conference is highly appreciated!

With kind regards
Alois Steindl and Horst Ecker

--

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Subject: ENOC2014: Session chairfor MS-09

From: "ENOC 2014" <enoc2014@tuwien.ac.at>

Date: Mon, June 16, 2014 10:49 pm

To: khedrih@sbb.rs

Cc: khedrih@eunet.rs

Priority: Normal

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Dear Prof. Katica R. (Stevanović) Hedrih,

since Profs. Mikhlin and Cartmell nominated you as possible chair for the sessions

of **MS-09 on "Nonlinear Dynamics of Structural and Machine Elements"**, we have preliminarily assigned you as session chair and ask you kindly, to take responsibility for these sessions. The preliminary program schedule can be viewed at

<http://osiris.tuwien.ac.at/enoc/sessions.php>.

If you are not able to chair the session(s), please let us know as soon as possible!

With kind regards

Alois Steindl and Horst Ecker

--

ENOC 2014 - 8th European Nonlinear Dynamics Conference

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8th European Nonlinear Dynamics Conference

ENOC 2014

July 6-11, 2014, Vienna, Austria



Session Overview

Session

MS09-6: Nonlinear Dynamics of Structural and Machine Elements VI

Time: Thursday, 10/Jul/2014: 10:30am - 12:10pm

Location: HS5

Session Chair: K Nakano

198 Places

Session Chair: Katica R. (Stevanović) Hedrih

Presentations

Enhancing vibrational energy harvesting using stochastic resonance within a bi-stable mechanical system

Kimihiko Nakano¹, Matthew P Cartmell², Zheng Rencheng¹, Honggang Hu¹, Dongxu Su¹

¹The University of Tokyo, Japan; ²University of Sheffield

Stochastic resonance is a physical phenomenon where large vibrations can occur when a weak sinusoidal modulating force is applied to a noise-excited bi-stable system, for a specific Kramers rate. It has been shown that such systems can effectively enhance the level of harvestable energy from ambient random vibration. In this paper it is shown by experiments that stochastic resonance can be initiated in a practical test system and that the power generated by a piezoelectric actuator can be measured. It is shown that in this specific test system the harvester actuator can generate power of 1.2 W while the system itself consumes 0.6 W in order to produce the periodic force to generate the necessary stochastic resonance, thus leading to a harvestable power of 0.6 W.

Petrović's theory of elements of mathematical phenomenology and phenomenological mapping applied to system nonlinear dynamics

Katica (Stevanović) Hedrih¹, Andjelka N Hedrih²

¹Mathematical Institute SANU, Belgrade, Faculty of Mechanical Engineering University of Nis, Nis, Serbia; ²State University of Novi Pazar, Serbia Using Mihailo Petrović's theory of mathematical phenomenology elements, phenomenological mapping in non-linear dynamics, linear and non-linear vibrations, signals, main and parametric resonance and dynamical absorptions, resonant jumps, trigger of coupled singularities, trigger of one side singularities, in global and local models of system dynamics – abstractions of different real system local and global dynamics are identified and presented.

Our results showed that Petrović's theory of elements of mathematical phenomenology is suitable for integration of knowledge in different areas of non-linear dynamics and useful for reductions of models of non-linear dynamics containing complexity of non-linear phenomena – regular, chaotic and stochastic regimes to explain non-linear dynamics of different physical, chemical or biological natures as well as social dynamics properties.

Results are also applicable to different systems with multiple deformable bodies with eleven degrees of freedom: chains, beams, plates, twisted chains, pendulums, and electrical chains and for biological oscillators.

Modelling of parametric resonance oscillations by two coupled modes

Tatiana Krasnopolskaya¹, Viacheslav Spektor¹, Dmytro Prykhodko², Alexandre Gourjii³

¹National Academy of Science of Ukraine, Ukraine; ²Taras Shevchenko National University of Kyiv; ³National Technical university of Ukraine "KPI" Two new mathematical models of parametric oscillations of two different continuous systems are worked out. The first system corresponds to a cantilever bar vibrations with low bending rigidity and the second system to cross-waves at fluid free-surface in a volume between two cylinders of finite length. In the cases of internal resonances parametric oscillations of continuous systems are approximated by two eigenmodes with different eigenfrequencies. On the basis of analysis of the largest Lyapunov exponents for a complex system three types of steady-state regimes are found: periodic, quasi-periodic and chaotic regimes. Phase portraits and power spectra are constructed and studied. The existence of chaotic attractors was established for the dynamical system presenting cross-waves and forced waves interaction at fluid free-surface in a volume between two cylinders of finite length. For averaged symmetric systems describing two parametric eigenmodes of a flexible cantilever bar with very low bending rigidity no chaotic regimes were found. Quasi-periodic and periodic regimes are typical for this dynamical system which has a symmetry with respect to unknown variables.

Nonlinear normal modes of vibrating mechanical systems and their applications

Yuri Vladimirovich Mikhlin¹, Konstantin Avramov², Christophe Pierre³

¹National Technical University "Kharkov Polytechnic Institute", Ukraine; ²National Academy of Sciences of Ukraine; ³University of Illinois at Urbana-Champaign

Nonlinear normal modes (NNMs) are periodic motions of specific type, which can be observed in different nonlinear mechanical systems. In the normal vibration mode a finite degree-of-freedom system vibrates like a single-degree-of-freedom conservative one. Significance of NNMs for mechanical engineering is determined by important properties of these motions.

Kauderer was the first, who developed quantitative methods for the NNMs analysis in two-DOF conservative nonlinear systems. Rosenberg considered n-DOF conservative systems and deduced the first definition of NNM. The NNMs based on determination of modal lines in configuration space, can be called the Kauderer-Rosenberg nonlinear normal modes. Shaw and Pierre developed an alternative concept of NNMs for nonlinear dissipative finite-DOF systems. Their researches are based on the computation of invariant manifolds of motion in phase space. This second type of the NNMs is called the Shaw-Pierre nonlinear normal modes.

Generalization of the NNMs concepts to forced, self-excited and parametric vibrations is possible; a generalization of the NNMs to continuous systems is made.

NNMs have been used to solve applied problems of mechanical and aerospace engineering. The Kauderer-Rosenberg NNMs are applied for analysis of large amplitude dynamics of finite-DOF nonlinear mechanical systems, such as systems with nonlinear absorbers; cylindrical shells with geometrical nonlinearity; cylindrical shells interacting with a fluid; shallow arches snap-through motions et al.

The Shaw-Pierre NNMs are applied to analyze dynamics of pre-twisted beam with geometrical nonlinearity; beam parametric vibrations; nonlinear vibrations of shallow shells with complex base; nonlinear vibrations of the vehicle suspension; nonlinear dynamics of the one-disk rotor in two bearings.



8th European Nonlinear Dynamics Conference

ENOC 2014

July 6-11, 2014, Vienna, Austria



Session Overview

Session

GT-5: General Track V

Time: Friday, 11/Jul/2014: 10:30am - 12:10pm

Session Chair: Katica R. (Stevanović) Hedrih

Session Chair: Yuri V. Mikhlin

Location: HS6

198 Places

Presentations

Moving-load-induced vibration of a multibody beam composed of elastic and rigid beam segments

Jia-Jang Wu

National Kaohsiung Marine University, Taiwan, Republic of China

Elements of mathematical phenomenology and qualitative /mathematical analogies on the basis of generalized Lissajous curves

Katica R. (Stevanović) Hedrih^{1,2}, Julijana Ju Simonović², Ana Ivanović-Šašić³, Ljiljana Kolar-Anić^{3,4}, Željko Čupić³, Andjelka N. Hedrih⁵

¹Mathematical Institute SANU Belgrade, Serbia, Serbia; ²Mechanical faculty University of Nis; ³Institute of Chemistry, Technology and Metallurgy, University of Belgrade; ⁴University of Belgrade, Faculty of Physical Chemistry; ⁵Department for Bio-Medical Science, State University of Novi Pazar

□haotic dynamics in an Earth pointing, magnetically controlled spacecraft

Fabio Della Rossa, Fabio Dercole, Marco Lovera

Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Italy

Nonlinear vibration of nonlocal Kelvin-Voigt viscoelastic nanobeam embedded in elastic medium

Danilo □ Karličić, Milan S. □ajić, Marija Stamenković

Mathematical Institute of the SASA, Serbia

Intermittencies in Bray-Liebhafsky reaction system

Itana Nuša Bubanja¹, Slobodan Anić^{1,2}, Maja Milenković¹, Željko Čupić², Ljiljana Kolar-Anić^{1,2}

¹Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia; ²Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Department of Catalysis and Chemical Engineering, Belgrade, Serbia

Spisak radova prihvacenih za ENOC 2014

ID: 326 Plenary session

Title: Elements of mathematical phenomenology and qualitative /mathematical analogies on the basis of generalized Lissajous curves
Katica (Stevanović) Hedrih, Julijana Simonović, Ana Ivanović-Šešić, Ljiljana Kolar Anić, Zeljko Cupić and Andjelka N Hedrih
Presenting Author: Katica (Stevanović) Hedrih

ID: 325 MS-09 Nonlinear Dynamics of Structural and Machine Elements

Title: Petrović's theory of elements of mathematical phenomenology and phenomenological mapping applied to system nonlinear dynamics
Authors: Katica (Stevanović) Hedrih and Andjelka N Hedrih, Presenting Author: Andjelka N Hedrih

ID: 237 MS-13 Nonlinear Dynamics in Biological Systems

Title: Synchronization in oscillatory model of embryo's ZP molecules in context of polyspermy block
Author(s) : Simonović Julijana; Hedrih, Andjelka , Presenting Author : Simonović Julijana

Contribution ID: 438 Type: MS-09 Nonlinear Dynamics of Structural and Machine Elements

Title: Rigid Body Coupled Rotation around Axes without Intersection
Author(s): Veljović, Ljiljana , Presenting Author : Veljović, Ljiljana

Contribution ID: 223 Type : GT General Track Contribution

Title: Nonlinear vibration of nonlocal Kelvin-Voigt viscoelastic nanobeam embedded in elastic medium
Author(s): Karličić, Danilo Z.; Čajić, Milan S.; Stamenković, Marija, Presenting Author: Karličić Danilo

Contribution ID: 271 Type: MS-06 Fractional Derivatives

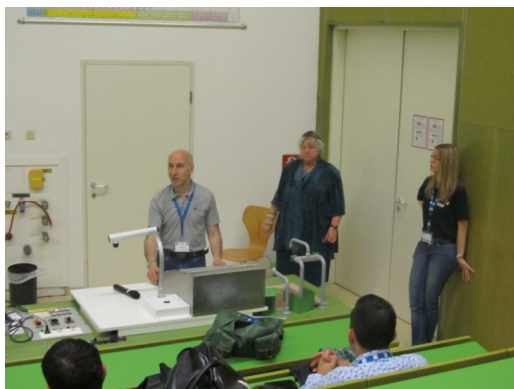
Title: "Nonlocal axial vibration of a fractional order viscoelastic nanorod"
Authors: Milan S. Čajić, Danilo Z. Karličić and Mihailo P. Lazarević , Presenting Author: Milan S. Čajić,

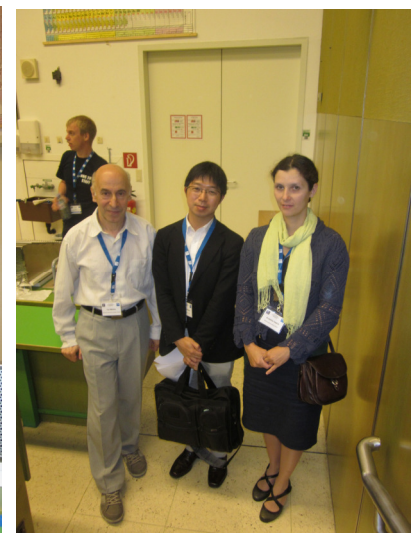
ID: 199

Title: The complex motion of Cable-suspended parallel robot under the influence of the disturbance
Author(s): Kevac :jubomir and Mprjana Filipović
Presenting Author: Kevac Ljubinko

ID: 386 Poster

Title: Three parametric testing of singularity and position of non-linear dynamics relative equilibrium of heavy material particle on eccentrically rotating rough circle line, with constant angular velocity
Authors: Marija Mikić and Marija Stamenković





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Spisak radova prihvacenih za ENOC 2014

ID: 326 Plenary session

Title: Elements of mathematical phenomenology and qualitative /mathematical analogies on the basis of generalized Lissajous curves

Katica (Stevanović) Hedrih, Juliajna Simonović, Ana Ivanvić-Šesić, Ljiljana Kolar Anić, Željko Cupić and Andjelka N Hedrih

Presenting Author: Katica (Stevanović) Hedrih

ID: 325 MS-09 Nonlinear Dynamics of Structural and Machine Elements

Title: Petrović's theory of elements of mathematical phenomenology and

phenomenological mapping applied to system nonlinear dynamics

Authors: Katica (Stevanović) Hedrih and Andjelka N Hedrih

Presenting Author: Andjelka N Hedrih

Spisak radova prihvacenih za ENOC 2014

Contribution ID: 271 Type: MS-06 Fractional Derivatives

Title: "Nonlocal axial vibration of a fractional order viscoelastic nanorod"

Authors: Milan S. Cajić, Danilo Z. Karličić and Mihailo P. Lazarević

Presenting Author: Milan S. Cajić,

ID: 199

Title: The complex motion of Cable-suspended parallel robot under the influence of the disturbance

Author(s): Kevac :jubomlp and Mprjana Filipović

Presenting Author: Kevac Ljubinko

ID: 386 Poster

Title: Three parametric testing of singularity and position of non-linear dynamics relative equilibrium of heavy material particle on eccentrically rotating rough circle line, with constant angular velocity

Authors: Marija Mikić and Marija Stamenković

XI*

PHYSICAL CHEMISTRY 2014

12th International Conference on
Fundamental and Applied Aspects of
Physical Chemistry

BELGRADE
22-26 September 2014

Physical Chemistry 2014, Belgrade, September 22-26, 2014

Invited Sectional Lecture:

Katica R. (Stevanović) Hedrih , **METHOD OF NONLINEAR DYNAMICS: PHENOMENOLOGICAL APPROXIMATE MAPINGS**

ABSTRACT: Phenomenological approximate mapping as an universal method of nonlinear dynamics is presented. The basic idea given by Mihailo Petrović and elaborated in his two books entitled: *Elements of mathematical phenomenology and Phenomenological mappings* is applied here on one physicochemical reaction system and a mechanical system. In particular, in both nonlinear systems the local dynamic nonlinear phenomena around stationary states are analyzed by the phenomenological approximate mappings. A general table with phenomenological linear and nonlinear approximate mappings around singular states is presented.

KEYWORDS: Nonlinear dynamics, phenomenological approximate mappings, stationary states, trigger of coupled singularities, linear approximation, nonlinear approximation, analogy.



26.03.2014.

Dear Dr Hedrih,

The Society of Physical Chemists of Serbia (<http://www.socphyschemserb.org/en/>) organizes the 12th International Conference on Fundamental and Applied Aspects of Physical Chemistry "Physical Chemistry 2014", which will be held in Belgrade, September 22-26, 2014. (<http://www.socphyschemserb.org/en/events/pc2014/>) We will be very honored if you could participate by giving a Section lecture. The choice of the title of the lecture is on you.

If you accept our invitation, please let us know.

Sincerely yours,

Dr Željko Čupić
Chairman
of Conference Scientific Committee

Dr Slobodan Anić
President
of the Society of Physical Chemists of Serbia

xii* DANS14 Days of Analysis in Novi Sad July 03 - 07, 2014, Novi Sad
 In the honor of Professor **Bogoljub Stankovic** on the occasion of his **90th birthday**



DANS14 Days of Analysis in Novi Sad
 July 03 - 07, 2014, Novi Sad
 In the honor of Professor Bogoljub Stankovic on the occasion of his 90th birthday

Petrović's Elements of mathematical phenomenology and phenomenological approximate mappings

**In honor of Professor Bogoljub Stanković on the
 occasion of his 90th birthday**



Катица Р. (Стевановић) Хедрих

Одељење за механику Математичког института САНУ у Београду
 и Машински факултет Универзитета у Нишу

Прив. адреса: 18000- Ниш, Србија, ул. Војводе Танкосића 3

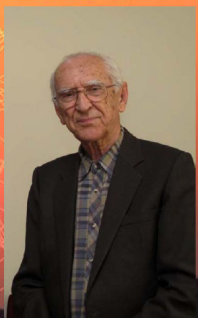


e-mail: khedrih@eunet.rs

	Thursday 3 rd July	Friday 4th July	Saturday 5th July	Sunday 6th July	Monday 7th July
9 – 9:40	Registration	A. Ivic	M. Kunzinger	D. Djordjevic	M. Mateljevic
9:50 – 10:30	Opening/ S. Pilipovic	G. Milovanovic	G. Hoermann	V. Dragovic	D. Stoeva
Coffee break					
11 - 11:40	L. Rodino	T. Atanackovic	R. Stainbauer	B. Dragovic	N. Antonic
11:50 – 12:30	Ceremony in honor of Prof. Stankovic	S. Coriasco	J. Toft	P. Ivanshin	V. Kapustin
Lunch break					Closing ceremony
14:30 – 15:10	M. Obberguggenberger	Daniel Abreu	14:30- 14:50	C. Saemann	Excursion with dinner
			14:55- 15:15	S. Simic	
15:15– 15:35	P. Mozolyako	D. Mitrovic	15:20- 15:40	B. Prangoski	
Coffee break					
16:00 – 16:20	K. Hedrih	Milan Merkle	Poster session		
16:25 – 16:45	Lj. Gajic	Monica Merkle			
16:50 – 17:10	H. Pejic	J. Manojlovic			
17:15 – 17:35	D. Selesi	V. Manoilovic			

DANS14 Days of Analysis in Novi Sad
July 03-07, 2014, Novi Sad
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This is the first Russian-Serbian mathematical meeting within the framework of scientific cooperation of Russian and Serbian academies of sciences and arts.
The meeting is open to participants from other countries.
It is organized with the aim of gathering mathematicians in order to establish fields of research of joint scientific interest.
The conference will be held at the Department of Mathematics and Informatics, Faculty of

DANS14 Days of Analysis in Novi Sad
July 03-07, 2014, Novi Sad
In the honor of Professor Bogoljub Stankovic on the occasion of his 90th birthday

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Elements of mathematical phenomenology and phenomenological approximate mappings

Katica R. (Stevanovic) Hedrih
Mathematical Institute SANU Belgrade and Faculty of Mechanical Engineering University of Nis
SERBIA
given at: **dans14** (ay. m.17)
id: **2842**
length: **min**
status: **accepted**
type:
www: <http://www.mi.sanu.ac.rs/>

LINK-Presentation: http://univie.ac.at/nuhag-php/dateien/talks/Hedrih_2014-05_001-AZAAbstracty Days 2914 Katica_Stewvanovic_Hedrih.pdf

DANS14 Days of Analysis in Novi Sad
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ABSTRACT:

1* Using discrete continuum method, fractional order signals analysis in hybrid system dynamics [3] is presented. For a class of fractional order system dynamics with finite number of degrees of freedom, independent eigen main fractional order modes are determined with corresponding elgen main coordinate of the system. A number of theorems are defined and proofed. It is shown that applications of qualitative, structural and mathematical analogies in analysis of fractional order signals appear in analogous mechanical, electrical and biological fractional order chains is very power, suitable an useful tools of mathematical phenomenology [1] to reduce research models to corresponding minimum, and, in same time, develop power of analysis use phenomenological mappings between local and global phenomena and properties. In a number of Tables, series of analogous signals with kinetic parameters of hybrid system dynamics are presented.

2* Phenomenological approximate mappings on nonlinear signal analysis in local area around of stationary points or states are presented with corresponding kinetic parameters in a number of Tables. For obtain approximate differential equations and approximate solutions in local area around singular points, linear and non-linear approximations are used. Method of local analysis based on phenomenological approximate mappings between local linear as well as nonlinear phenomena is power to obtain information of all nonlinear phenomena in the nonlinear dynamics of the system for completing elements for global analysis of the system nonlinear dynamics and stability and using different analogies, obtained result applied for analysis nonlinear dynamics in other physically disparate systems. These results are based on the previously punished Author's References in area of nonlinear dynamics [4,5].

Keywords: mathematical phenomenology; phenomenological approximate mappings; fractional orfer; nonlinear; signals; analogies; theorem.

References

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XIII* 9th SEEDI Conference, Belgrade, 15-16th May 2014, Digitalizacija naučne i kulturne bazine Srbije

120.000 examples of university books in publishing house „Naučna knjiga“:

Author Prof. Dr. Ing. Dipl. Math. Danilo P. RAŠKOVIĆ (1910-1985)

Hedrih (Stevanović) R. Katica

Mathematical Institute SANU Belgrade,
and Faculty of Mechanical Engineering University of Niš, Serbia

9th SEEDI Conference

Belgrade, 15 - 16th May, 2014

Abstract This distinguished scientific figure of exquisite creative energy and inspired enthusiasm, a scholar deeply attached to the Yugoslav and Serbian scientific and cultural heritage and an exquisite pedagogue of high ethical principles is in the living memory of many generations of students whom he taught how to learn and love mechanics, as a basic scientific branch of mechanical engineering either directly, through his lectures, or through his various and numerous textbooks and collections of problems which circulate in more than 140,000 copies. His disciples and colleagues are glad that he had the ability to transmit to them his great enthusiasm permeated with his sincere devotion for mechanics and his exquisite scientific eagerness.

Prof. Dr. Ing. Dipl. Math. Danilo P. RAŠKOVIĆ lectured mechanics, straight of materials and oscillation theory at the faculties of mechanical engineering in Belgrade, Niš, Kragujevac, Novi Sad and Mostar, as well as in the Faculty of Science in Belgrade, Faculty of Philosophy in Novi Sad, Faculty of Electronics in Niš and at the Military-Technical College in Belgrade.

Professor RAŠKOVIĆ wrote a considerable number of university textbooks which ran through numerous editions. Some of them still hold records as for the number of editions and copies printed within the group they belong to. In addition, he wrote a series of textbooks in the field of mechanics for secondary technical schools, as well as a number of chapters in professional technical handbooks, mimeographed course materials and textbooks for post-secondary schools of mechanical engineering. He also wrote several textbooks for postgraduate studies.

We are of the opinion that this occasion should be used to say a few things about professor Rašковиć's four-year-long co-operation with the publishing house "Naučna knjiga" concerning the publication of his university textbooks, collections of problems and various other handbooks. Follows the review of university textbooks and handbooks written by professor Danilo Rašковиć and published by "Naučna knjiga" in total 120,000 examples:

- * **MECHANICS I (STATICS)** - a 18,000-copy printing of first three editions; II edition 1960; subsequent editions 1960 (a 3,000-copy), 1962, 1964, 1965, 1968, 1971, 1973, 1978 (a 3,000-4,000-copy).
- * **MECHANICS II (KINEMATICS)** - first two editions in a 13,000-copy printing. Editions: 1947, 1950, 1955.
- * **MECHANICS III (DYNAMICS)** - first two editions in 10,000 copies. Editions: 1947, 1956, 1962, 1973.
- * **STRAIGHT OF MATERIALS** - editions: 1955, 1961, 1962, 1965, 1967, 1971, 1973, 1977, 1980, 1984 - approximately 25,000 copies.
- * **OSCILLATION THEORY** - editions: 1957, 1965 - 6,000 copies.
- * **TABLES OF STRAIGHT OF MATERIALS** - ran through 15 editions) approximately 40,000 copies.
- * **ESSENTIAL MATRIX CALCULUS** - 1971 edition, 1,500 copies.
- * **ELASTICITY THEORY** - 1985 edition, 2,000 copies.

Some of his university textbooks were published by other publishing houses such as "Zavod za izdavanje udžbenika", "Grafivinska knjiga", "Tehnika knjiga". Among the publications for postgraduate studies the following should be mentioned: **ANALYTICAL MECHANICS** and **TENSOR CALCULUS**, both edited by the Faculty of Mechanical Engineering in Kragujevac.

All contents of these publications are material resources existing as scientific heritage in area of mechanics in Serbia and corresponding presentation in digital form is of great scientific interest and open possibilities to disseminate these fundamental books in area of theoretical and applied mechanics to now generations of students, researchers and engineers.



Beograd, 20.X.1964.

Draga Katicе,

Hvalа Vаs na poslatоj kopiji prihvаtаnjа recenzije kolegа recenzentа. Taj akt i onaj prethodni kopirео sаm i priložio rukopisu, kаko trеbi "Nаučnа knjigа". Bаdа sа ovi mоgо mеnеti spеrаnjа sа sеbеm knjigа, pа čеmо prеglеd rukopisа i sve što idе us to ostvаriti nа pоdеtаk novembа. Dаo sаm ostеtе ing. Vitiću, pа čе i ovi biti vеrоvаtno s gotovоi.

Kаdа sаm bio kod "Nаučnе knjigе" uspeo sаm dа od njih dobijem јоdаn primеrаk "Eirike sеdеtаkа" /is njаkоvе bibliotekе/, kаkо sаm srediо i sаm stvаr dа vаs nе muđа višе, niti dа molite Niliu u nоje ime. Primеnjem dа sаm Vаs mоgо nаgаnjеrio sа ovim poslovim, ali štа čеtе, Vi sаtе mј jоlјinа usnеniа i pоsеb. јоd јоdаn vеlikо Vаm hvalа.

Kаkо sаtе Vi? Iustе li mоgо poslа? Sigurnо, dа iustе, kаkо je takvа, mіkеd mіrе. Kаkо je gоspоin? Vlаdаr je vеd vеlikі onak. Pоljubite gа.

Primitе mоgо posrаvа od nоje suprugе.

U sаzvаlеst, mоgо, mоgо toplіh posrаvа.

Vаš

[Signature]

Prof. D. RAŠKOVIĆ



Beograd, 16.08.'84

Draga Katicе,

"Jеbе sаm bio kod "Nаučnе knjigе", pеr nіsаm mоgо, јер sаm bіlі nа odmеru. Iаkо sа kolegа Antеlić i Brčić bіlі vеоlі agіlni, referat /recenzija/ je morao dа čеkа. Kаkо šp vidite recenzija je perfektnа. Rukopis se sаnо svіdе kolegі Brčićа. Prof. Antеlićа nіsаm vіdео, bіo je dаlо bolеstаn. Bаdа je sve u rеdu.

"Nаučnа knjigа" je sаdržіlа rukopis rеvі dеtаljnоg prеglеdа i vоljnо je dа gа štоpа u 2000 primеrаkа /u ohiđеnјm еkоnоmskо oprrаdаnі tіrеk/. Litоgrаfіsаnjе nе nаlаzі u оbіr sbrоg vеоlі kоmplikоvаnоg tеkstа i nеrеtаbіlnoštі.

Oni sаmtrеju

1. dа sаm u Niliu trеbа dа plati hоnоrаr rеcenzіtаm,
2. dа pіsаn pеdа ostеtе u tuku nа posru ili bаnеru rаdі klіrіrаnjа,
3. dа pоvrаnа posаd sаm is Niliа nоje dа sа ostvаrі sа dva mіlіnа

a/ dоtеljіvаnjа sаklіzі bаspоvаtne sаsе nоvе rаdі sаnjеnjа pоrаnjа sаsе knjigе,

b/ nаsаrаntоvаnоg оtkupа izvеsnе kоlіčіnа knjіgа

Sаm dа dа izvіrі kаlkuласіju, pа mоlе dа ih sаm isvеstі. Obrеkаtеnjе je nајbоljе poslati sаm.

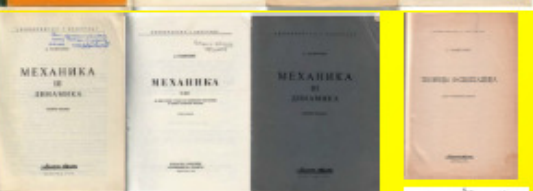
Kаkо sаtе Vi i Vаdі? Jеstе li sа dоbrо odmоrіlі? Knоgі sа hvalа kаkо іm je bіlо dоbrо u Gоškoj.

Šurіp і sаvіnjаvаn sа sа еvеntuаlnе grоškе. Bеlіs dа pоslјm dоkumеntа.

Srđеkаn posrаv

[Signature]

/prof. D. Rašковиć/



ACKNOWLEDGEMENTS.
Sciences of Republic Serbia through Mathematical Institute SANU Belgrade Grants ON144002 "Theoretical and Applied Mechanics of Rigid and Solid Body, Mechanics of Materials" and ON174001 "Dynamics of hybrid systems with complex structures. Mechanics of materials".



9th SEEDI Conference, Belgrade, 15-16th May 2014



**xv* 1st International Symposium on Machines, Mechanics and Mechatronics
- Current Trends, July 1-2, 2014.** <http://smmm2014.mas.bg.ac.rs/>

http://www.iftomm.org/index.php?option=com_content&view=article&id=31:conferences&catid=13&Itemid=141

SMMM2014 se organizuje prvi put u organizaciji Mašinskog fakulteta u Beogradu uz pokroviteljstvo IFToMM-a:

TENTATIVE SCHEDULE OF ACTIVITIES AND PRESENTATIONS

**1ST INTERNATIONAL SYMPOSIUM ON MACHINES, MECHANICS AND MECHATRONICS -
CURRENT TRENDS**

Serbia, University of Belgrade, Faculty of Mechanical Engineering on July 1-2, 2014.



16:00-16:30	Coffee Break, Room 210, floor 2	
16:30-18:45	Session III, Room 211 – Special Session <u>Co-Chairs:</u> Livija Cvetičanin, Katica Stevanović - Hedrih <u>Moderator:</u> Pol Spanos	
	Wei Li Lincong Chen Natasa Trisovic	FIRST-PASSAGE OF STOCHASTICALLY DYNAMICAL SYSTEM WITH FRACTIONAL DERIVATIVE AND POWER-FORM RESTORING FORCE
	Katica Stevanović Hedrih	ENERGY ANALYSIS OF DYNAMICS OF A MULTI-DEFORMABLE BODY SYSTEM WITH FRACTIONAL ORDER DISCRETE CONTINUUM LAYERS
	Livija Cvetičanin Ištvan Biro	MODELING OF IMPACT OF A TENNIS BALL WITH COURT: AN OVERVIEW



University of Belgrade,
Faculty of Mechanical Engineering



Ministry of Education,
Science and Technological Development
of the Republic of Serbia



International Federation for the
Promotion of Mechanism and Machine
Science



XIV* The XVI INTERNATIONAL SCIENTIFIC-EXPERT CONFERENCE ON RAILWAY RAILCON '14, which will be held in Niš, Serbia on **October 09 – 10, 2014**.

INTERNATIONAL SCIENTIFIC-EXPERT CONFERENCE ON RAILWAYS



Katica R. (Stevanović) Hedrih, **Energy analysis of fractional order oscillations of a composition of the train by a chain model of fractional order properties**

XV* Matematika i primene, na Matematičkom fakultetu Univerziteta u Beogradu **17. i 18. oktobra 2014**,
<http://alas.matf.bg.ac.rs/~konferencija/>

Katica R. (Stevanović) Hedrih
APROKSIMATIVNO FENOMENOLOSKO PRESLIKAVANJE
(Approximate phenomenological Mappings)

XVI* Centennial jubilee of Russian Academician Yury N. Rabotnov (2014)

Katica R. (Stevanović) Hedrih, (2014), **Elements of mathematical phenomenology in dynamics of multi-body system with fractional order discrete continuum layers**, Dedicated to Centennial jubilee of Russian Academician Yury N. Rabotnov, Special issue of International Journal of Mechanics, (Paper submitted in January 2014), Journal indexed in SCOPUS (<http://www.naun.org/cms.action?id=2828>). (prihvaceno za stampu).

Andjelka N. Hedrih and Katica R. (Stevanović) Hedrih, (2014), **Analysis of energy state of discrete fractional order spherical net of mouse *zona pellucida* before and after fertilization**, Special issue of International Journal of Mechanics, Dedicated to Centennial jubilee of Russian Academician Yury N. Rabotnov, (Paper submitted in January 2014), Journal indexed in SCOPUS (<http://www.naun.org/cms.action?id=2828>). (prihvaceno za stampu).

Matematički institut SANU, **Odeljenje za mehaniku**

Sreda, 5. mart 2014. u 18 casova, sala 301f:

Katica (Stevanovic) Hedrih: **ELEMENTS OF MATHEMATICAL PHENOMENOLOGY IN DYNAMICS OF MULTI-BODY SYSTEM WITH FRACTIONAL ORDER DISCRETE CONTINUUM LAYERS**

Sreda 8.10.2014. 18 casova, sala 301f, (Plan)

Katica R. (Stevanovic) Hedrih, **Energy dissipation in dynamics of a class of the fractional order system**

Matematički institut SANU , **Mathematical Colloquim**

Petak, 21.03.2014. u 14h, sala 301f, MI SANU

Vladimir Dragovic, Katica (Stevanovic) Hedrih, Dusan Zorica

NAUCNI REZULTATI NA PROJEKTIMA MATEMATICKOG INSTITUTA SANU U 2013 IZ OBLASTI MEHANIKA

Koncepcija sastanka: Rukovodioci projekata, u dogovoru sa Upravnikom odeljenja, ce prikazati u optim crtama, naucne rezultate koje su dobili istrazivaci na njihovim projektima a primljeni su za tampu ili su publikovani u 2013. godini.

Matematički institut SANU , **Seminar za istoriju i filozofiju matematike, mehanike i astronomije**

UTORAK, 4. mart 2014. u 12:15 sati

Katica (Stevanovic) Hedrih, **MIHAILO PETROVIC I NJEGOVI PROFESORI: POENKARE, APEL, PIKAR, PANLEVE I BUZINESK**

UTORAK, 22. april 2014. u 12:15 sati

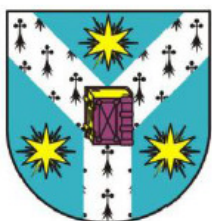
Katica (Stevanovic) Hedrih, **ANALOGIJE: kvalitativne, strukturne i matematicke; primeri fenomenologog preslikavanja.**

С поштованјем,

У Београду и Нишу, 30 септембра 2014 године

Катица Р. (Стевановић) Хедрих
Руководилац пројекта ОI174001

Прилози:



THE 13th INTERNATIONAL CONFERENCE
OF TENSOR SOCIETY ON
DIFFERENTIAL GEOMETRY AND
ITS APPLICATIONS,
AND INFORMATICS BESIDES.

The 86th Anniversary of Radu MIRON'S Birth.



*Faculty of Math.
Al. I. Cuza Univ.
Iasi, Romania*

テンソル学会
(TENSOR SOCIETY)

*Inst. of Math.
"Octav Mayer"
Romanian Academy*

To: Prof. dr.Katica R. (Stevanovic) Hedrih, Academician UHEAS
Mathematical Institute SANU Belgrade, Department for Mechanics
And Faculty of Mechanical Engineering, University of Nis, Serbia
Priv. address: 18000-Nis, ul Vojvode Tankosika 3/22, Serbia
E-mail: khedrih@eunet.rs, katicahedrih@gmail.com, khedrih@sbb.rs

Tsukuba, July 19, 2013

Dear Professor dr. Katica R. (Stevanovic) Hedrih,

On behalf of Tensor Society, we would like to invite you to "The 13th International Conference of Tensor Society on Differential Geometry and its Applications and Informatics Besides" with great pleasures. Furthermore, we suggest that you will give a plenary lecture (45~60 min.) entitled: "Generalized function of fractional order dissipation of system energy and extended Lagrange differential equation in matrix form (*Dedicated to 86th Anniversary of Radu Miron's Birth*)". It is very glad for us if you could inform your visiting and staying schedule and arrival date, its time at Iasi Station or airport at advance.

Looking forward to waiting concerning the above matter at your earliest convenience,

Sincerely yours.
T. Kawaguchi

Professor, dr. Tomoaki KAWAGUCHI
President of Tensor Society
Sengen 1-13-33, Tsukuba
305-0047 Japan
Tel. 81-(0)29-851-5615, Fax 81-(0)29-856-6576 (Tsukuba)
Tel/Fax 81-(0)3-3947-3910 (Tokyo)
E-mail: tensor-ns@nifty.ne.jp and kawaguchi_tom@ybb.ne.jp

Tomoaki Kawaguchi





UNIVERSITATEA "ALEXANDRU IOAN CUZA" din IAȘI

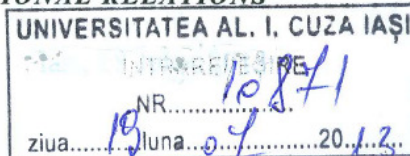
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e-mail rectorat@uaic.ro; <http://www.uaic.ro>

OFFICE OF THE VICE-RECTOR FOR INTERNATIONAL RELATIONS



To the attention of **Prof. dr. Katica R. (Stevanović) Hedrih**
Academician UHEAS – Ukrainian Higher Education Academy of Sciences
Mathematical Institute SANU Belgrade
Department for Mechanics and Faculty of Mechanical Engineering
University of Niš, Serbia, 11 000

INVITATION LETTER

It is our great pleasure to invite you to attend

THE 13th INTERNATIONAL CONFERENCE OF TENSOR SOCIETY ON DIFFERENTIAL GEOMETRY AND ITS APPLICATIONS, AND INFORMATICS BESIDES

that will be held from September 3rd (Tuesday) to September 7th (Saturday) 2013 at the Faculty of Mathematics of Alexandru Ioan Cuza University and the Mathematical Institute "O.Mayer" in Iași, Romania.

Given your contribution to the academic field, the Organizing Committee would be honored if you could participate and give a talk at this conference.

Please find details on the programme, lodging and travel information in the First and Second Announcements you have already received.

Hoping that your schedule will allow you to accept this invitation,

Sincerely yours,

On behalf of the Organizing Committee,


Prof. Dr. Henri Luchian
Vice-Rector for International Relations



TENSOR SOCIETY

c/o Kawaguchi Institute of Mathematical Sciences

Matsugaoka 2-7-15, Chigasaki, Japan 253-0025

Chigasaki Post Office: P. O. Box 22

Tel. 81-(0)29-851-5615, Fax 81-(0)29-856-6576

E-mail: tensor-ns@nifty.ne.jp tensorsociety@ybb.ne.jp

President: Tomoaki KAWAGUCHI, Prof., Dr. of Tech. Sci.

CERTIFICATE

September 15, 2013

To: Prof. dr Katica R. (Stevanović) Hedrih,

We acknowledge that you have been appointed a member throughout life of the Editorial Board in Tensor Society dated on January, 2013.

President of Tensor Society

Professor Dr. Tech. Sci. Tomoaki KAWAGUCHI

Tomoaki Kawaguchi

c/o Kawaguchi Institute of Mathematical Sciences

Chigasaki Post Office: P. O Box 22

Tel. 81-(0)29-851-5615, Fax 81-(0)29-856-6576

E-mail: tensor-ns@nifty.ne.jp tensorsociety@ybb.ne.jp



テ ン ゾ ル 学 会

TENSOR

Edited by

Tomoaki KAWAGUCHI

With the cooperation of

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S. IGARASHI
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Y. SATO
L. TAMÁSSY

W.-G. BOSKOFF
H. KAWAGUCHI
M. PRVANOVIĆ
H. SHIMADA

K. (STEVANOVIĆ) HEDRIH
K. MATSUMOTO
M. SATO
M. SHIMBO

NEW SERIES

Volume 74, Number 1

April 2013

PUBLISHED BY

THE TENSOR SOCIETY

CHIGASAKI, JAPAN

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TENSOR

Edited by

Tomoaki KAWAGUCHI

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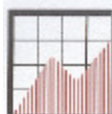
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MAZOVIA INNOWACYJNA SZKOŁA WYŻSZA

BR. 07M-1(17)/2013
L.Dr. 654/2013

Siedlce, July 02, 2013

Professor
Katica R. (Stevanovic) Hedrih
Department of Mechanics,
Mathematical Institute SANU
ul. Knez Mihailova 36/III
11 000 Belgrade
Serbia
Tel./Fax: +381 18 4241663

Dear Prof. Dr. Katica Hedrih,

On behalf of the Organizing Committee of the 8th International Symposium on Classical and Celestial Mechanics (CCMECH'8) to be held in Siedlce, Poland from September 25 till 29, September 2013 we are glad to invite you to participate in the conference and to present your talk

"Fractional order differential equations of dynamics of two mass particles, constrained by a fractional order element",

Please note that the registration fee is 400 PLN. It covers organization expenses, conference materials and refreshment room at the Symposium. It can be paid on site upon arrival. Participants of the symposium CCMECH'8 will be accommodated at the hotel "Dwor Moscibrody" situated in the picturesque place near Siedlce (www.dwor.moscibrody.pl). Costs of accommodation and meal are covered by the participants of the symposium.

We kindly ask you to confirm your participation by September 10, 2013 via e-mail: alexander_prokopenya@sggw.pl and to let us know some details concerning your arrival and departure (number of train or flight, date and time).

We look forward to seeing you in Siedlce.

Best wishes,

DZIEKAN
Wydziału Nauk Technicznych



M. Symanowicz
Mirosław Symanowicz
dr Mirosław Symanowicz

Organizing Committee of CCMECH'8

Collegium Mazovia Innowacyjna Szkoła Wyższa

Sokolowska str. 161, 08-110 Siedlce, Poland

Tel. +48 25 633 3032

msymanowicz@mazovia.edu.pl

COLLEGIUM MAZOVIA
INNOWACYJNA SZKOŁA WYŻSZA

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 08-110 Siedlce NIP 821 21 02 933
 tel. 25 633 30 32 REGON 711643331

12th CONFERENCE

Dynamical Systems - Theory and Applications

December 2-5, 2013. Lodz, POLAND.



November 27, 2013

Professor Katica R. Stevanovic Hedrih

Mathematical Institute SANU Belgrade
and Faculty of Mechanical Engineering
University of Niš
SERBIA

Invitation for publication in the DSTA 2013 Special Issue

Dear Professor Hedrih,

Your papers: "Vector analysis of kinetic parameters of mass particle separation dynamics from space discrete system" (MAT144), author: Katica R. Stevanovic Hedrih; "Two mass particle fractional order plane system dynamics" (OTH145), author: Katica R. Stevanovic Hedrih, have been provisionally scheduled to be considered for publication in some Special Issues of the *International Journal of Dynamics and Control* (IJDC); journal of *Nonlinear Dynamics and Systems Theory* (NDST), respectively.

Using the details provided in your personal profile at www.dys-ta.com, please take into account the attached journal guidelines and send the full-text papers not later than **January 15, 2014** (final deadline).

In order to distinguish these papers from the versions already published in a Conference Book please slightly modify their title, extend, make a citation of the corresponding DSTA Book, or write in "Acknowledgements" that the papers have been presented during 12th Conference on Dynamical Systems - Theory and Applications.

On behalf of Organizing Committee of the DSTA 2013 I wish you fruitful discussions and a successful participation in the conference.

Yours sincerely,

Jan Awrejcewicz