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Стручни извештај о учешћу у научном скупу

PHYSICAL CHEMISTRY 2016, September 26-30, 2016.
13th International Conference on Fundamental and Applied Aspects of Physical Chemistry

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За овај скуп сам позвана да одржим пленарно предавање, чиме сам била почаствована, и на који сам се одазвала са радошћу и послала организаторима рад, које публикован у Зборнику радова ове зналајне међународне научне конференције, високог научног ранга. Библиографски подаци о раду су:

Katica R. (Stevanović) Hedrih, (2016), Universal Method across different area of sciences and transient of knowledge flows, Plenary Lecture, Proceedings of **PHYSICAL CHEMISTRY 2016m September 26-30, 2016. 13th International Conference on Fundamental and Applied Aspects of Physical Chemistry**, Editors: Željko Čupić and Slobodan Anić, **Society of PHYSICAL CHEMISTRY, Volume I, pp. 38-46 , ISBN 978-86-82475-34-7**

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Присутствовала сам првог дана Конференције, свечаном отварању Конференције и првим пленарним предавањима, али нисам одржала предавање, које је по програму било у каснијим поподневним сатима, а ја сам имала лет за Харков у 15сати, где сам отпутовала ради учешћа у раду међународне научне конференције Nonlinear Dynamics Kharkov 2016, у раду које сам учесник са пленарним предавањем и чланством у научном одбору Конференције.

Са организаторима Конференције, **PHYSICAL CHEMISTRY 2016**, сам се договорила да предавање одржим на Научном семинару Друштва физико-хемичара Србије у једном од јесењих редовних термина.

Изражавам своју захвалност организаторима Конференције, **PHYSICAL CHEMISTRY 2016**, за част да см била и члан Научног комитета Конференције, као и за позив, а посебно што су организатори и посебне секције из Нелинеарне динамике и што се ангажују на промоцији мултидисциплинарности научног сазнања из области

Нелинеарне динамике, као и на промоцији научног дела Михаила Петровића "Елементи математичке феноменологије" и "Феноменолошког пресликавања."

С поштовањем,

У Београду, 12 октобра 2016.



Katica R. (Stevanović) Nedrih
Руководилац пројекта OM174001



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UNIVERSAL METHOD ACROSS DIFFERENT AREA OF SCIENCES AND TRANSIENT OF KNOWLEDGE FLOWS

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ABSTRACT

Under the author's use of Petrović's "Elements of mathematical phenomenology", especially qualitative and mathematical analogy, new analogous models and phenomena in dynamics of physically disparate nature systems and between them of mechanical, physic-chemical, electrical and biodynamical oscillators are pointed out.

Use these results, author plan to present an optimal method for multidisciplinary research and education not only in special an area of science, but in other disparate area of science for education, not only for students, but also for scientific researchers. Numerous examples will be presented for illustration of the method of optimal and most effective power of research coupling models and methods across all, "for first look" pure disparate area of sciences. Also series of analogous theorems about energy in fractional order discrete and multi-deformable body systems and chain mechanical, electrical and biodynamical oscillators will be presented.

Advances to theory of collision between bodies and its generalization (use Petrović's theory) to the collision between two rolling rigid bodies will be presented.

The basic idea given by Mikhailo Petrović and elaborated in his two books entitled: Elements of mathematical phenomenology and Phenomenological mappings is applied here on one physic-chemical reaction system and a rheonomic nonlinear mechanical system. In particular, in both nonlinear systems the local dynamic nonlinear phenomena around stationary states are analyzed by the phenomenological approximate mappings.

KEYWORDS: Mikhail Petrović's theory, mathematical phenomenology, linear and nonlinear phenomena, stationary states, trigger of coupled singularities, qualitative and mathematical analogy, physically disparate systems, universal method across different area of sciences, transient of knowledge flow.

- [12]K. Hedrih (Stevanović), The eleventh world congress in Mechanism and machine Sciences, IFToMM, Proceedings, China Machine press, Tianjin, China, April 1-4, 2004, **2**, 1475-1479.
- [13]K. Hedrih (Stevanović), , The 5th International Congress of Serbian Society of Mechanics. Arandjelovac, Proceedings Published by Serbian Society of Mechanics and Faculty of Technical Sciences, Novi Sad, June 15-17, 2015, pp. 98-98. pp. 1-4.
- [14]K. Hedrih (Stevanović), (2005), Chaotic Dynamics and Control of Systems and Processes in Mechanics (Eds: G. Rega, and F. Vestroni), IUTAM Book, in Series Solid Mechanics and Its Applications, Edited by G.M.L. Gladwell, Springer, 2005, 37-45.
- [15]Preface: Elements of mathematical phenomenology and phenomenological mapping in non-linear dynamics, Edited by Katica R. (Stevanovic) Hedrih, Ivan Kosenko, Pavel Krasilnikov and Pol D. Spanos, Special Issue of International Journal of Non-Linear, Mechanics, 2015, **73**, 1-128
- [16]Katica (Stevanović) Hedrih, Mechatronics and control, colloquium in honour of the 65th birthday of prof. Nenad D. Pavlović and prof. Tomislav Petrović, The 3rd International conference mechanical engineering in xxi century, proceeding, September 17 - 18, Niš, Faculty of mechanical engineering University of Niš, 2015, 313-318.
- [17]K. Hedrih (Stevanović), A. N Hedrih , Journal of Vibration and Control, 2016, **22**, 18-36,
- [18]K. Hedrih (Stevanović), Beseda o Mihailu Petroviću i fascinirajućoj nelinearnoj dinamici, Srpski matematičari, Maj mesec matematike -- Srpski matematičari , Naucni skup maj 2012, Srpska akademija nauka I umetnosi, Univerzitet u Beogradu, Zavod za izdavanje udžbenike, Beograd 2015, 29-64.
- [19]K. Hedrih (Stevanović), A. Ivanović-Šašić, J. Simonović, Lj. Kolar-Anić, Ž. Čupić, Scientific Technical Review, 2015, **65** (3), 27-38.
- [20]K. Hedrih (Stevanović), J. Simonović, A. Ivanović-Šašić, Lj. Kolar-Anić, Ž. Čupić, Scientific Technical Review, 2015, **65** (3), 37-45.
- [21]Lj. Kolar-Anić, Ž . Čupić, V. Vukojević, S, Anić, S., Dinamika nelinearnih procesa, Fakultet za fizičku hemiju, Univerzitet u Beogradu, Beograd 2011.
- [22]S. Maćešić , Ž. Čupić, S. Anić, Lj. Kolar-Anić, International Journal of non-linear mechanics, 2015, **73**, 25-30.
- [23]Yu. A. Mitropolyskiy, (1955), Nestashionamie proshesi v nelineynykh sistemah, AN USSR, Kiev. (in Russian)
- [24]Gleick James, Chaos, Making a new Sciences, Penguin BOOKS, 1987/1988.
- [25]Penrose Roger, The Emperor's New Mind, concerning Computers, Minds and the Laws of Physics, Oxford University Press 1985/ 1990.







