70 година рада Математичког института САНУ

ПРОГГРАМ

Међународни минисимпозијум

„Механика лома и нумеричке методе“

Математички институт САНУ и Пројекат ON174001,

Београд, 16 новембар 2016

PROGRAM

International Mini-Symposium

“Fracture Mechanics and Numerical Methods“

Mathematical Institute SASA and Project ON174001,

Belgrade, November 16, 2016

Organizers:

Slobodanka Boljanović,

Mathematical Institute of SASA, Belgrade, Serbia

Ljubica Milović,

Faculty of Technology and Metallurgy,

University of Belgrade, Serbia

Acknowledgment: The International Mini-Symposium "Fracture Mechanics and Numerical Methods" has been organized in the scope of the 70th anniversary of the Mathematical Institute of the Serbian Academy of Science and Arts. The Mini-Symposium was organized thanks to the financial support from the Serbian Ministry of Education, Science and Technological Development under the projects:

ON 174001 "Dynamics of hybrid systems with complex structures. Mechanics of Materials", coordinated through Mathematical Institute of Serbian Academy of Sciences and Arts with Project Leader **Katica (Stevanović) HEDRIH**

and

TR 35011 "Pressure equipment integrity under simultaneous effect of fatigue loading and temperature", coordinated through Faculty of Technology University of Belgrade, with Project Leader **Ljubica MILOVIĆ**

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A WORD FROM THE ORGANIZER

"...***In a world made of steel***
Made of stone..."

You may remember the 1983 film *Flashdance*, where the young Alex (Jennifer Beals) has a day job as a welder in a steel mill (she works in a men's' world), and dances at night (she dances in a world of her dreams) in a club in Pittsburgh – the world's steelmaking capital at the time, producing $\frac{1}{4}$ of the total US steel production. In a world made of steel and stone, as described in the Oscar winning movie theme, a new scientific discipline – Fracture Mechanics – appeared in early 20th Century. The development of steel production technology led to an increasing application of metals in construction development. The introduction of welding as a new process of joining metal led to an increase of failures of welded structures. Therefore, Fracture Mechanics has its origins as a discipline in the studying of the phenomena of failures and deformations preceding failures. Today, it is unavoidable as a discipline in the construction process from the standpoint of assessing the life of the structure, determining residual stresses, selection of materials and optimization of the structure itself.

There are many reasons for organizing the symposium and conferences dedicated to Fracture Mechanics, because disaster failures of structures still happen, hence problems with cracks in constructions are of essence for the safety of constructions on macro, mezzo, micro and nano-levels.

At the mini-symposium 'Fracture Mechanics and Numerical Methods' organized to celebrate the 70th anniversary of the Mathematical Institute of the Serbian Academy of Science and Arts, the focus is on developing analytical and numerical tools needed for solving problems of initiation and propagation of cracks in welded, but also in all other structures under variable cyclic loadings, temperature and environment.

Ljubica Milović

РЕЧ ОРГАНИЗАТОРА

"...***In a world made of steel***
Made of stone..."

Можда се сећате филма из 1983., *Flashdance*, у коме млађана Alex (Jennifer Beals) дању заварује у челичани (she works in a mens' world), а ноћу игра (she dances in a world of her dreams) у клубу у Pittsburgh-у, тадашњој светској метрополи челика у коме се производила чак $\frac{1}{4}$ укупне производње челика у САД. У свету створеном од челика и камена, о коме говори Оскаром награђена насловна нумера из филма, настала је почетком XX века, нова научна дисциплина - механика лома. Развој технологије производње челика довео је до све веће примене метала у изради конструкција. Увођењем заваривања, као новог поступка спајања метала, повећава се број ломова заварених конструкција. Дакле механика лома је започета проучавањем феномена лома и деформације која претходи лому, а данас је незаобилазна дисциплина у процесу конструисања са становишта процене века конструкције, одређивања заосталих напона, избора материјала и оптимизације саме конструкције.

Повода за организовање симпозијума и конференција посвећених механици лома је много, јер се катастрофални ломови конструкција и даље догађају, па су проблеми прслина у конструкцијама од суштинског значаја за њихову сигурност на макро, мезо, микро и нано нивоима.

На минисимпозијуму "Механика лома и нумеричке методе" организованом поводом седамдесет година постојања Математичког института Српске академије наука и уметности, акценат је на развоју аналитичких и нумеричких алатки потребних за решавање проблема настанка и ширења прслина у завареним, али и свим осталим конструкцијама при деловању променљивих оптерећења, температуре и околине.

Љубица Миловић

PREFACE OF THE ORGANIZER

High computational power of modern computers motivates scientific community to develop new approaches and methodologies suitable for modeling of scientific and engineering problems. Scientific discipline that has intensively developed in the last few decades is computational fracture mechanics. Through the establishment of relevant links between the laws and principles of applied mechanics and mathematical and computer methods, the failure behavior of scientific and real physical problems can theoretically be analyzed.

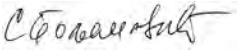
Various mechanical, environmental and chemical effects threaten the strength and durability of engineering systems under service loading. Such complex phenomena can often cause unexpected in-service degradation i.e. failure. Therefore, significantly important aspect is to assess the integrity of engineering systems either in design phase or during the periodical technical controls and inspections through the development of reliable computational models in which appropriate analytical and/or numerical approaches associated with experimental verifications are taken into account.

Due to importance of a topic, the Mini-Symposium on "Fracture Mechanics and Numerical Methods" is organized. This scientific meeting aims to encourage of knowledge, experience and new ideas among scientists and engineers, and to ensure the public dissemination of the scientific results achieved, as well as to promote and foster research in computational fracture mechanics.

The Mini-Symposium covers the following themes: structural analysis, fatigue strength assessment, failure analysis, fracture mechanics and software development for the life assessment, and the Abstracts of invited lecturers are included in this Booklet.

The support for this Mini-Symposium, provided by the Mathematical Institute of the Serbian Academy of Sciences and Arts (SASA) and the Ministry of Science and Technological development, Serbia through the Project OI174001, is gratefully acknowledged.

Organizer of the Mini-Symposium:



dr **Slobodanka Boljanović**,
Mathematical Institute of SASA, Belgrade

ПРЕДГОВОР ОРГАНИЗАТОРА

Висока рачунарска моћ савремених рачунара мотивише научну заједницу да развија нове приступе и методологије погодне за моделирање научних и техничких проблема. Научна дисциплина која се интензивно развија у последњих неколико деценија је рачунарска механика лома. Кроз успостављање одговарајућих веза између закона и принципа примењене механике и математичких и компјутерских метода, понашање при лому научних и реалних физичких проблема може бити теоријски анализирано.

Различити ефекти проузроковани прИменом механичких, атмосферских и хемијских услова угрожавају чврстоћу и издржљивост инжењерских система при дејству радних оптерећења. Такви сложени феномени могу изазвати током рада оштећење, тј. лом. Према томе, врло важан аспект је процена интегритета инжењерских система, било у фази пројектовања или за време периодичних техничких контрола и инспекција кроз развијање поузданих прорачунских модела у којима су укључени у разматрање одговарајући аналитички и/или нумерички приступи заједно са експерименталним проверама.

Важност теме је довела до организовања Мини-симпозијума под називом "Механика лома и нумеричке методе". Овај научни скуп има за циљ да подстакне размену знања, искуства и нових идеја између научника и инжењера и да се омогући јавно приказивање постигнутих научних резултата, као и да промовише и иницира даља истраживања у рачунарској механици лома.

Мини-симпозијум обухвата следеће теме: структурална анализа, процена чврстоће при замору, анализа лома, механика лома и развој софтвера за процену преосталог века, а апстракти позваних предавача су укључени у овој књизи.

Одржавање овог Мини-симпозијума је подржано од стране Математичког института Српске академије наука и уметности као и Министрства науке и технолошког развоја Републике Србије у оквиру пројекта ОИ174001 на чему се срдачно захваљујем.

Организатор Мини-симпозијума:

др **Слободанка Бољановић**,
Математички Институт САНУ, Београд

PROGRAM

INTERNATONAL MINI-SYMPOSIUM

"Fracture Mechanics and Numerical Methods"

Mathematical Institute of SASA and Project OI174001,
Belgrade, Serbia, November 16, 2016, from 10:00-20:00h, room II, first floor, Kneza Mihaila 36

Програм

Интернационалног мини-симпозијума

„Механика лома и нумеричке методе"

Математички институт САНУ и Пројекат ОИ174001,
Београд, 16. новембар 2016, од 10:00-20:00h, сала II, први спрат, Кнеза Михаила 36

Organizers:
dr **Slobodanka Boljanović**, Associated Research Professor, Mathematical Institute of SASA, Belgrade, Serbia
Prof. dr **Ljubica Milović**, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Организатори:
др **Слободанка Бољановић**, виши научни сарадник, Математички институт САНУ, Београд, Србија
проф. др **Љубица Миловић**, Технолошко-металуршки факултет, Универзитет у Београду, Србија

Welcome address:

Professor dr **Zoran Ognjanovć,** director of the Mathematical Institure of SASA**,**
Professor **Katica (Stevanović) Hedrih**, Project Leader of Project ON174001

Opening remarks by Organizers:
"Importance of Research of Damage and Fracture Mechanics and Numerical Methods".
dr **Slobodanka Boljanović**
dr **Ljubica Milović**

Поздравна реч:
Професор др **Зоран Огњановић,** директор Математичког института САНУ
Професор **Катица (Стевановић) Хедрих,** руководилац Пројекта ОН174001

Уводна реч организатора: „*Значај истраживања у области механике лома и нумеричких метода*".
др **Слободанка Бољановић**
др **Љубица Миловић**

* * *

First Session chair by:

Slobodanka Boljanović, Mathematical Institute of SASA, Belgrade, Serbia
Jelena M. Đoković, Technical faculty in Bor, University of Belgrade, Bor, Srbija
Strain Posavljak, Faculty of Mechanical engineering, University of Banja Luka, Bosnia and Herzegovina,

First Session - ***Invited Lectures 30 minutes.***

* Numerical Analysis of the Crack-tip Fields and Two-parameter Fracture Mechanics

Yury G. Matvienko
Mechanical Engineering Research Institute of the Russian Academy of Sciences,
4 M. Kharitonievsky Per., 101990 Moscow, Russia
e-mail: ygmatvienko@gmail.com

Нумеричка анализа поља око врха прслине и двопараметарска механика лома

Yury G. Matvienko
Mechanical Engineering Research Institute of the Russian Academy of Sciences,
4 M. Kharitonievsky Per., 101990 Moscow, Russia
e-mail: ygmatvienko@gmail.com

* Numerical and experimental analysis of Pipe Ring Notched Bend specimen

Darko Damjanović[1], Dražan Kozak[2] and Ivan Samardžić[3]
Sveučilište J. J. Štrosmajera u Osijeku, Strojarski fakultet u Slavonskom Brodu,
Trg I. B. Mažuranić 2, Slavonski Brod, Hrvatska
E-mail: [1]darko.damjanovic@gmail.com, [2]dkozak@sfsb.hr, [3]isamar@sfsb.hr

Нумеричка и експериментална анализа прстенастог испитног узорка

Дарко Дамјановић[1], Дражан Козак[2] и Иван Самарџић[3]
Свеучилиште Ј. Ј. Штросмајера у Осијеку, Стројарски факултет у Славонском Броду,
Трг И. Б. Мажуранић 2, Славонски Брод, Хрватска
E-mail: [1]darko.damjanovic@gmail.com, [2]dkozak@sfsb.hr, [3]isamar@sfsb.hr

* Determination of fatigue crack propagation limit curves and their application for integrity assessment calculations

János Lukács
Institute of Materials Science and Technology
University of Miskolc, Faculty of Mechanical Engineering and Informatics
H-3515 Miskolc-Egyetemváros, Hungary
e-mail: janos.lukacs@uni-miskolc.hu

Одређивање граничне криве раста заморне прслине и њена примена на прорачун оцене интегритета

János Lukács
Institute of Materials Science and Technology
University of Miskolc, Faculty of Mechanical Engineering and Informatics
H-3515 Miskolc-Egyetemváros, Hungary
e-mail: janos.lukacs@uni-miskolc.hu

* Fracture and deformation at high temperatures

Ljubica Milovic
Department of General Technical Sciences
University of Belgrade, Faculty of Technology and Metallurgy
e-mail: acibulj@tmf.bg.ac.rs

Лом и деформација на повишеним температурама

Љубица Миловић
Катедра за општетехничке науке
Технолошко-металуршки факултет Универзитета у Београду, e-mail:acibulj@tmf.bg.ac.rs

Second Session chair by:

Ljubica Milovic, University of Belgrade, Faculty of Technology and Metallurgy
Yury G. Matvienko, Mechanical Engineering Research Institute of the Russian Academy of Sciences,
Nataša Trišović, Faculty of Mechanical Engineering, University of Belgrade, Belgrade, Serbia

Second Session. *Invited Lectures 30 minutes.*

* Crack initiation life of metallic parts in function of their geometry

Strain Posavljak
Faculty of Mechanical Engineering, University of Banja Luka
Banja Luka, Republic of Srpska, Bosnia and Herzegovina, E-mail: strain.posavljak@unibl.rs

Век до појаве иницијалне прслине код металних делова у функцији њихове геометрије

Страин Посављак
Машински факултет, Универзитет у Бања Луци
Бања Лука, Република Српска, Босна и Херцеговина, E-mail: strain.posavljak@unibl.rs

* Interaction Modeling for Multiple Propagating Fatigue Cracks

Željko Božić
University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture,
I. Lucica 5,10000 Zagreb, Croatia, e-mail: zeljko.bozic@fsb.hr

Моделирање интеракције раста вишеструких заморних прслина

Жељко Божић
Свеучилиште у Загребу, Факултет стројарства и бродоградње,
И. Лучића 5,10000 Загреб, Хрватска
e-mail: zeljko.bozic@fsb.hr

* Material characterization and numerical simulation of a dissimilar metal weld to support phased array ultrasonic inspection

Szabolcs Szávai[1,*], Zoltán Bézi[2], Judit Dudra[3], Peter Rózsahegyi[4]
Bay Zoltán Nonprofit Ltd. for Applied Research, Engineering Division, Iglói Street 2, Miskolc 3519, Hungary
e-mail: [1]szabolcs.szavai@bayzoltan.hu, [2]zoltan.bezi@bayzoltan.hu
[3]judit.dudra@bayzolatn.hu, [4]peter.rozsahegyi@bayzoltan.hu

Карактеризација материјала и нумеричка симулација разнородног завареног споја као подршка ултразвучном испитивању методом фазне решетке

Szabolcs Szávai[1,*], Zoltán Bézi[2], Judit Dudra[3], Peter Rózsahegyi[4]
Bay Zoltán Nonprofit Ltd. for Applied Research, Engineering Division, Iglói Street 2, Miskolc 3519, Hungary,
e-mail: [1]szabolcs.szavai@bayzoltan.hu, [2]zoltan.bezi@bayzoltan.hu
[3]judit.dudra@bayzolatn.hu, [4]peter.rozsahegyi@bayzoltan.hu

* Residual strength assessment of cyclically loaded structural components

Slobodanka Boljanović
Mathematical Institute of SASA, Department of Mechanics,Kneza Mihaila 36, Belgrade, Serbia
E-mail: slobodanka.boljanovic@mi.sanu.ac.rs, slobodanka.boljanovic@gmail.com

Процена преостале чврстоће циклично оптерећених компоненти структура

Слободанка Бољановић
Математички институт САНУ, Одељење за механику, Кнеза Михаила 36, Београд, Србија
E-mail: slobodanka.boljanovic@mi.sanu.ac.rs, slobodanka.boljanovic@gmail.com

КОКТЕЛ - COCTAIL (approximately from 14:15-15:15h)

Third Session chair by:
Darko Damjanović, J. J. Strossmayer University of Osijek, Mechanical Engineering Faculty, Trg I. B. Mažuranić 2, Slavonski Brod, Croatia
János Lukács, Institute of Materials Science and Technology, University of Miskolc, Faculty of Mechanical Engineering and Informatics
Dubravka Mijuca, University UNION Nikola Tesla Belgrade, Belgrade, Serbia

Third Session. ***Invited Lectures 30 minutes.***

* The application of reanalysis method (modification of dynamic characteristics) to solve practical problems of structural strength

Nataša Trišović, Ana Petrović
Faculty of Mechanical Engineering, University of Belgrade, Belgrade, Serbia, E-mail: ntrisovic@mas.bg.ac.rs, aspetrovic@mas.bg.ac.rs

Примена методе реанализа (модификације динамичких карактеристика) на решавање практичних проблема чврстоће конструкција

Наташа Тришовић, Ана Петровић
Машински факултет, Универзитет у Београду , Београд, Србија, E-mail: ntrisovic@mas.bg.ac.rs, aspetrovic@mas.bg.ac.rs

* Analytical and numerical calculations of Mode I stress intensity factor of cracked thin-walled beams

Jelena M. Djoković[1], Snežana D. Vulović[2], Ružica R. Nikolić[2,3], Miroslav M. Živković[2]
[1]Faculty of Mechanical Engineering, University of Belgrade, Bor, Serbia, E-mail: jelenadjokovic@gmail.com
[2]Faculty of Engineering, University of Kragujevac, Kragujevac, Serbia, E-mail: vsneza@kg.ac.rs, zile@kg.ac.rs
[3]Research Center, University of Žilina, Žilina, Slovakia, E-mail: ruzicarnikolic@yahoo.com

Аналитички и нумерички метод одређивања Мода I фактора интензитета напона танкозидних греда

Јелена М. Ђоковић[1], Снежана Д. Вуловић[2], Ружица Р. Николић[2,3]. Мирослав М. Живковић[2]
[1]Технички факултет у Бору, Универзитет у Београду, Бор, Србија, E-mail: jelenadjokovic@gmail.com
[2]Факултет инжењерских наука, Универзитет у Крагујевцу, Крагујевац, Србија , E-mail: vsneza@kg.ac.rs, zile@kg.ac.rs
[3]Research Center, University of Žilina, Žilina, Slovakia, E-mail: ruzicarnikolic@yahoo.com

* Numerical modeling of single overload ratio in fatigue crack growth

Stevan Maksimović
Military Technical Institute, Ratka Resanović 1, Belgrade, Serbia, E-mail: s.maksimovic@mts.rs

Нумеричко моделирање појединачних пикова у анализи ширења прскотине

Стеван Максимовић
Војнотехничи институт, Ратка Ресановић 1, Београд, Србија, E-mail: s.maksimovic@mts.rs

* Application of extended finite element method for crack propagation modeling

Aleksandar Grbovic,
Department of aviation, University of Belgrade, Faculty of Mechanical Engineering
e-mail: agrbovic@mas.bg.ac.rs

Примене проширене методе коначних елемената у моделирању раста прслина

Александар Грбовић
Катедра за ваздухопловство, Машински факултет Универзитета у Београду
e-mail: agrbovic@mas.bg.ac.rs

Fourth Session chair by:

Željko Božić, University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture
Stevan Maksimović, Military Technical Institute, Ratka Resanović 1, Belgrade, Serbia
Szabolcs Szávai, Bay Zoltán Nonprofit Ltd. for Applied Research, Engineering Division, Miskolc, Hungary

Fourth Session, Part One - *Invited Lectures 30 minutes*

* Interfacial stress and its analysis by Finite Element Method

Dubravka Mijuca
University UNION Nikola Tesla Belgrade,Belgrade, Serbia , E-mail: dmijuca@fgm.edu.rs

Напони на граници материјала и њихова анализа Методом коначних елемената

Дубравка Мијуца
Универзитет УНИОН Никола Тесла Београд, Београд, Србија, E-mail: dmijuca@fgm.edu.rs

* Micromechanical criteria of ductile fracture initiation in welded steel joints

Marko Rakin[1], Bojan Međo[1] and Aleksandar Sedmak[2]
[1] Department of General Technical Sciences , [1]University of Belgrade, Faculty of Technology and Metallurgy
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[2] Department of Technology of Materials, [2]University of Belgrade, Faculty of Mechanical Engineering
e-mail: asedmak@mas.bg.ac.rs

Микромеханички критеријуми настанка жилавог лома заварених спојева челика

Марко Ракин[1], Бојан Међо[1] и Александар Седмак[2]
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Fourth Session chair by:

Željko Božić, University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture
Stevan Maksimović, Military Technical Institute, Ratka Resanović 1, Belgrade, Serbia
Szabolcs Szávai, Bay Zoltán Nonprofit Ltd. for Applied Research, Engineering Division, Miskolc, Hungary

Fourth Session, Part Two - *Invited Contribution 20 minutes*

* Fatigue life estimation of structural elements up to crack initiation

Ognjen Ognjanović
Military Technical Institute, Ratka Resanović 1, Belgrade, Serbia, E-mail: ognjenognjanovic@yahoo.com

Процена века елемената конструкција до појаве иницијалног оштећења

Огњен Огњановић
Војнотехничи институт, Ратка Ресановић 1, Београд, Србија, E-mail: ognjenognjanovic@yahoo.com

* Strength analysis of aircraft structural components with respects to fracture mechanics by finite element

Katarina Maksimović[1], Ivana Vasović[2]
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Анализа чврстоће елемената авионских конструкција са аспекта механике лома применом коначних елемената

Катарина Максимовић[1], Ивана Васовић[2]
[1]Градска управа Града Београда, Краљице Марије 1, Београд, Србија, E-mail: kmaksimovic@mts.rs
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* Residual life simulation of the tower structure system for oil and gas exploration

Milenko Stašević
College of Technical Professional Studies, Zrenjanin, Serbia
E-mail: milenkostasevic2013@gmail.com

Симулација преосталог века торња постројења за истраживање нафте и гаса

Миленко Сташевић
Висока техничка школа струковних студија, Зрењанин, Србија
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Dr Slobodanka S. Boljanović was born in Belgrade and after graduation from the First Belgrade Gymnasium enrolled the Faculty of Mechanical Engineering at the University of Belgrade. She obtained the B. Sc. degree in 1991 at the Department of Aeronautical Engineering. Simultaneously, Dr Boljanović studied at the Faculty of Mathematics, University of Belgrade, and in 1994 graduated with the B.Sc. degree at the Department of Mechanics.

Immediately after graduation from the Faculty of Mechanical/Aeronautical Engineering Dr. Boljanović enrolled the postgraduate studies at the Department of Aeronautical Engineering where she obtained Master's degree in 1997, and under the supervision of Prof. dr Zlatko Petrović, obtained Ph. D. degree in 2006. Furthermore, her second doctoral dissertation was presented at the Faculty of Mathematics, University of Belgrade under the supervision of Prof. dr Boško Jovanović, and in 2012 she obtained Ph. D. degree at the Department of Numerical mathematics and optimization.

From 1994 she has been intensively involved in scientific research at the Military Technical Institute Belgrade – the Department of Strength. Since October 2014 she has been engaged as an associate contributor of Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade. Staring from March 2015 she is employed at the Mathematical Institute of SASA, first as an Assistant Research Professor and from November 2016 as Associate Research Professor under Project OI174001 where she develops mathematical models of real physical problems.

Moreover, from 2002 to 2015, as an assistant, then from 2006 senior lecturer, and from 2008 professor of branch studies at the College of Mechanical Engineering, Belgrade, she has been lecturing for the following subjects: Fluid Mechanics, Statics and Technical Mechanics.

Through the scientific research activities she examined theoretical and numerical modeling of engineering systems and materials, as well as fracture mechanics of engineering systems under time-variable loading conditions, applicable in design phase and/or during exploitation (i.e. periodical maintenance inspections) of structures. Scientific aspects of realized theoretical investigations, so far, include: the stress analysis, the modeling of material behavior, the fatigue analysis, fracture mechanics, the development of reliable software programs for the simulation of residual life related to crack initiation phase, and the strength simulation of structures in the crack growth phase.

The scientific results achieved through the theoretical investigation of different fracture mechanics problems she published in more then 40 scientific articles/papers, out of which more than 30 as the first author, as well as in two doctorial dissertations presented at the Faculty of Mathematics and the Faculty of Mechanical Engineering at the University of Belgrade. Of the mentioned papers with citations in international and national journals indexed in reference databases, she published, as the first author, 9 papers in scientific international journals, as well as 5 papers in scientific national journals. Furthermore, she published more than 20 papers in proceedings and presented at the international scientific conferences.

At the invitation of Editors she is engaged as a reviewer in both top and leading international journals (***International Journal of Fatigue, published by Elsevier*** and ***Journal of Engineering Mechanics, published by ASCE***), as well as in leading national journal (***Scientific Technical Review, published by the Military Technical Institute***). Also, she has been engaged as a reviewer at two international scientific conferences. Furthermore, as a member of scientific committee she actively participated in the organization of the international scientific conference in 2013, and additionally as a member of organizing committee, contributed in preparation of international scientific conference in 2011.

Ljubica Milović

Degrees:

2008 Ph.D. in technical sciences, University of Belgrade, Faculty of Mechanical Engineering
1999 M.Sc. in technical sciences, University of Belgrade, Faculty of Mechanical Engineering
1994 Welding Specialist Diploma
1991 Dipl. Mechanical engineer, University of Belgrade, Faculty of Mechanical Engineering

Professional memberships

Society for Structural Integrity and Life -DIVK
European Structural Integrity Society-ESIS
Serbian Society of Mechanics
Serbian Welding Society

Positions and employment

2014- Associate Professor, Department of General Technical Sciences TMF
2009-2014 Assistant Professor, Department of General Technical Sciences TMF
1995-2009 Teaching Assistant, Faculty of Technology and Metallurgy (TMF), University of Belgrade
1992-1994 Research Associate, Department of Motor Vehicles, Faculty of Mechanical Engineering, University of Belgrade
1991-1992 Research Associate, Institute for Machinery (transport, construction and mining), Faculty of Mechanical Engineering, University of Belgrade

Scientific field

Fracture mechanics of welded joints
Integrity and safety of structures

Research work

Designing of hydraulic lift platforms, investigation of cargo lifting and transportation units, optic analysis of stresses and deformations, measurement of residual stresses of welded joints, testing of mechanical properties of welded joints, testing of fracture mechanics of welded joints, investigation of high strength low alloy steels, investigation of high temperature steels, low-cycle fatigue of materials and their welded joints, experimental and analytical analysis of structures in processing industry.

Social competences

2013- Director of the scientific Journal Structural Integrity and Life EISSN 1820-7863
2010- Assembly President, Society for Structural Integrity and Life
Member of the Editorial Board of the scientific Journal Structural Integrity and Life
2009- Member of the Managing Board of the Society for Structural Integrity and Life
2008-2010 Secretary-General of the Society for Structural Integrity and Life

Information about the Mini-symposium "Non-Linear Dynamics with Applications in Engineering Systems" - in organization of Mathematical Institute of SASA and Project OI 174001 - - Belgrade, Serbia, October 26, 2016. -

The Mini-symposium "Non-Linear Dynamics with Applications in Engineering Systems" was successfully held on October 26, 2016, in the Mathematical Institute of SASA. This Mini-symposium was the third one in the series of the Mini-symposiums organized as a part of the activities of Project OI 174001 with Prof. dr Katica (Stevanović) Hedrih as leader, within the 70 year anniversary of the Mathematical Institute of SASA. The basic premise for the organization of this Mini-symposium was to provide the open forum for the exchange of ideas and inspiration among researchers from the Project OI 174001 and their collaborate researchers, as lecturers or an active listener. The organizer of this Mini-symposium was dr Ivana Atanasovska, Associate Research Professor, representing the Mathematical Institute of SASA and Project OI 174001, Belgrade, and co-organizer was dr Mirjana Filipović, Associate Research Professor, representing the Mihajlo Pupin Institute, Belgrade.
Before the working sessions of Mini-symposium, **Prof. dr Zoran Ognjanović**, director of the Mathematical Institute of SASA, and **Prof. dr Radivoje Mitrović**, dean of Faculty of Mechanical Engineering in Belgrade, briefly addressed to the organizers, esteemed guests and participants.




The **11 Invited Plenary lectures** were held during the working part of the Mini-symposium "Non-

Linear Dynamics with Applications in Engineering Systems" within the three thematic sessions.


The lecturers whose have been invited in this Mini-symposium have many years research affirmation from different areas in nonlinear dynamics, from analytical and numerical, via experimental research to applications in real systems. Besides the lectures from Serbia, **Prof. dr Valentina Golubović – Bugarski** for the Faculty of Mechanical engineering, University of Banja Luka, Bosnia and Herzegovina, and **Prof. dr Radoslav Tomović** from the Faculty of Mechanical Engineering, University of Montenegro, have had the participations as guest-lectures. All of the lectures have been original and very inspirational, and have been met with great interest of auditorium and accompanied by intensive discussions in the interaction of information. Each of the speakers after the successful presentation and discussion awarded the Certificate of the successful Invited Lecture presentation.

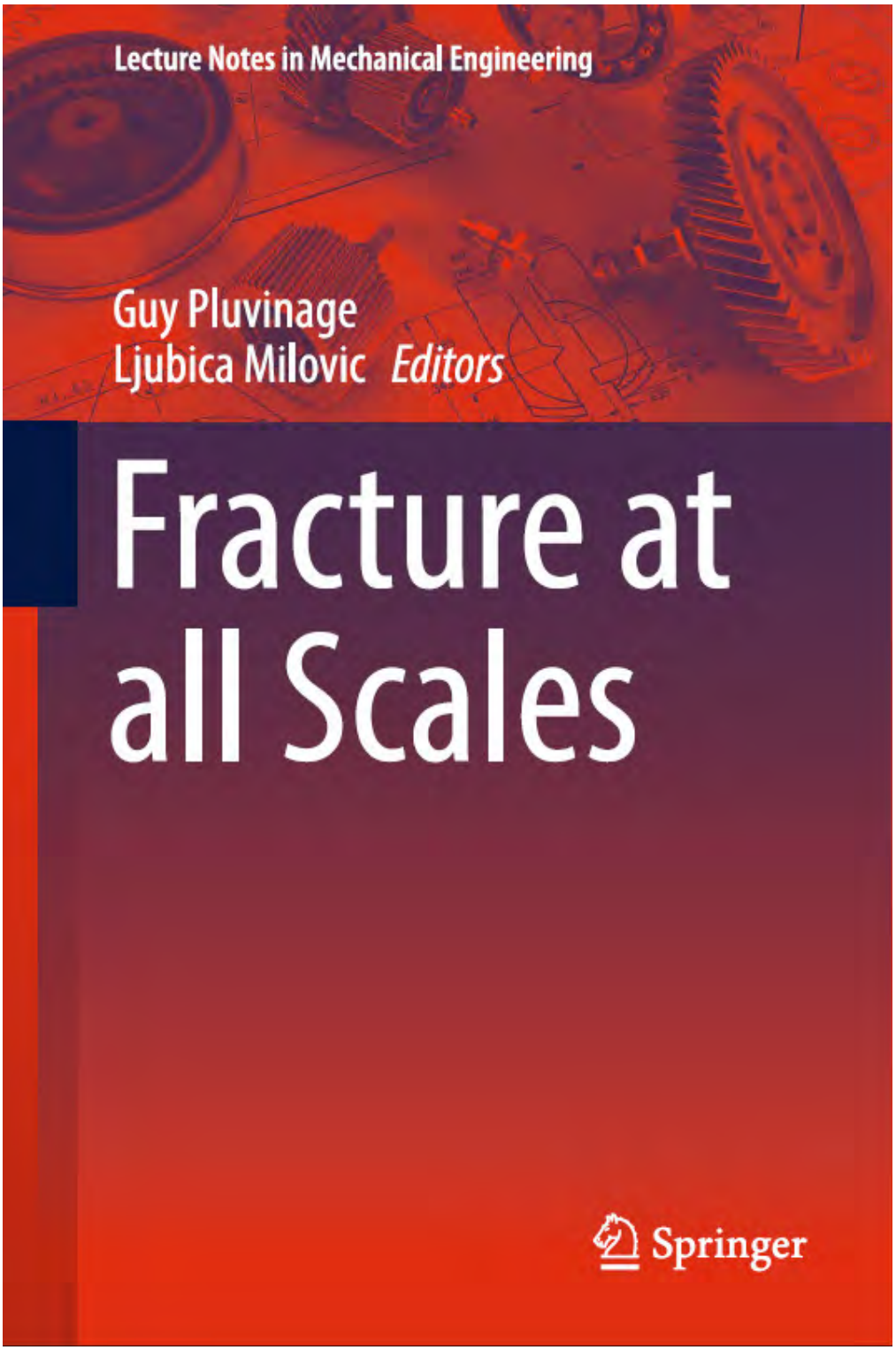


Besides the working part of the Mini-symposium, there were the opportunities for informal discussions, establish new contacts and ideas for future joint research.
Abstracts of the presented lectures in a bilingual presentation on Serbian and English were published in the **Booklet of Abstracts** with **cataloging in National Library of Serbia**. The Booklet of Abstracts is available on the website of the Mathematical Institute of SASA at the following link http://www.mi.sanu.ac.rs/novi_sajt/research/conferences.php.

In Belgrade, October 31, 2016.

dr Ivana Atanasovska, Associate Research Professor,
Mathematical Institute of SASA


UNIVERZITET U NIŠU
MAŠINSKI FAKULET NIŠ
MEHANIKA LOMA I OŠTEĆENJA
MATEMATIČKA TEORIJA
REČNIK POJMOVA I PRILOZI
Katica (Stevanović) HEDRIH
Dragan B. JOVANOVIĆ
2003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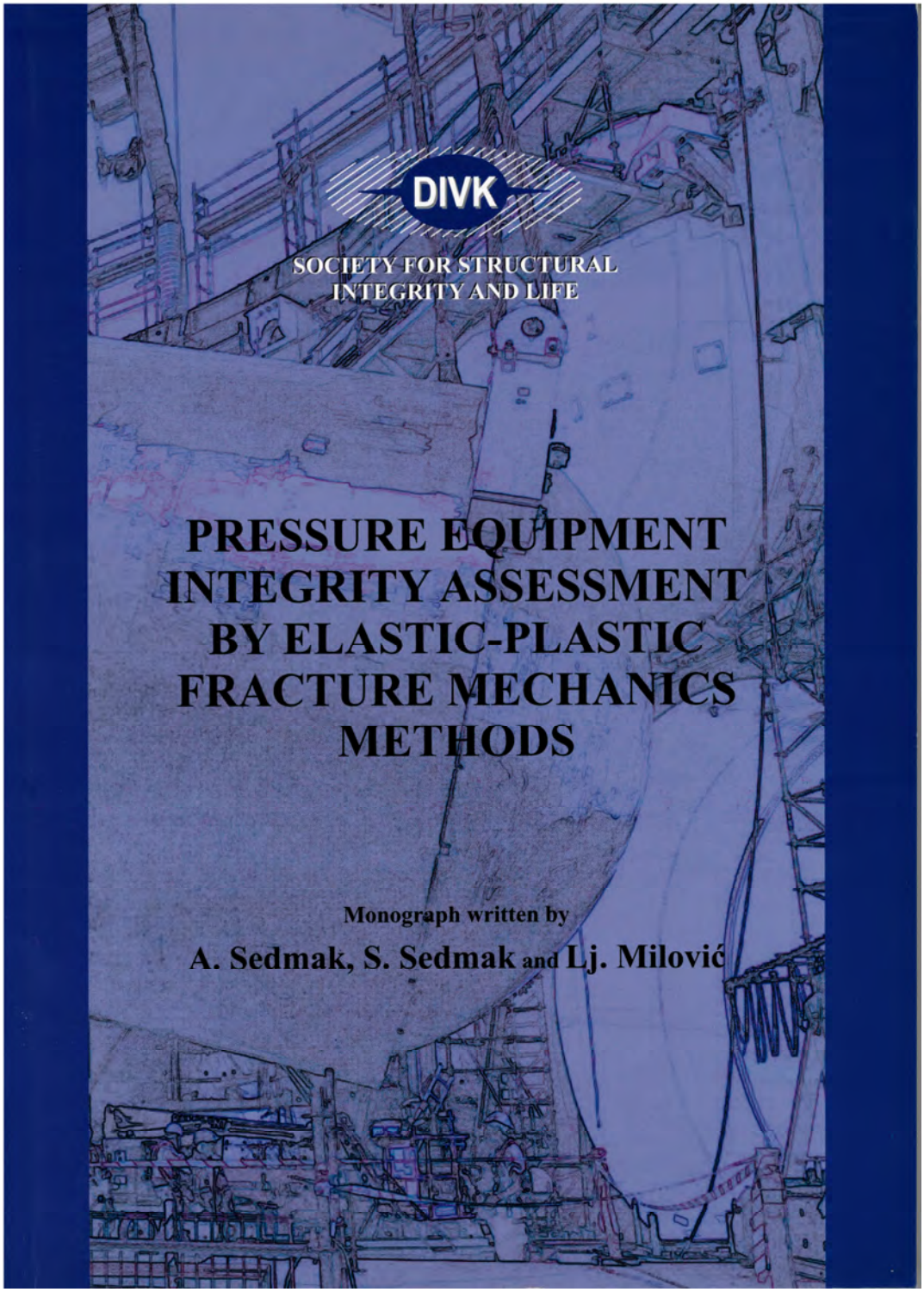
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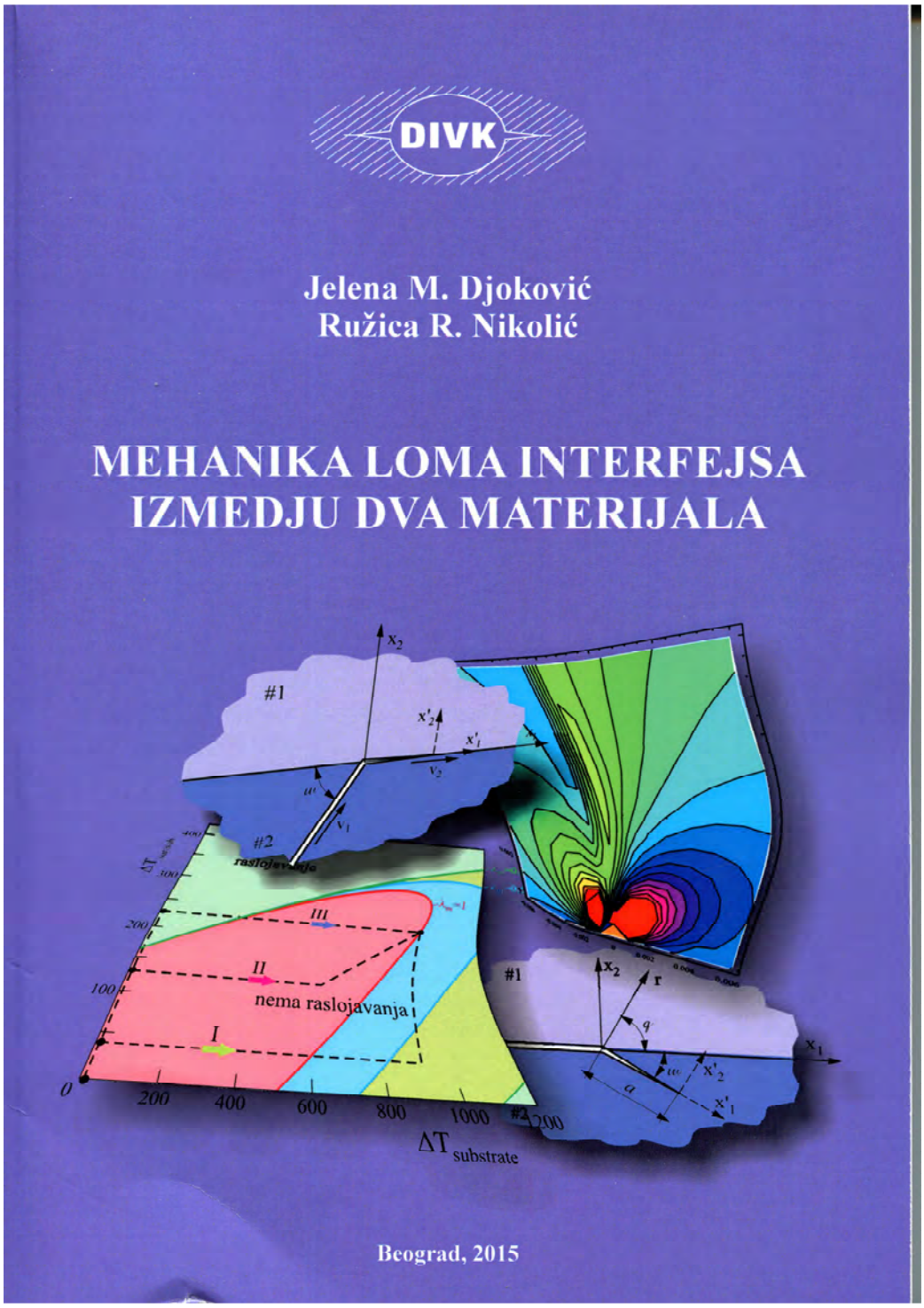
Monograph written by
A. Sedmak, S. Sedmak and Lj. Milović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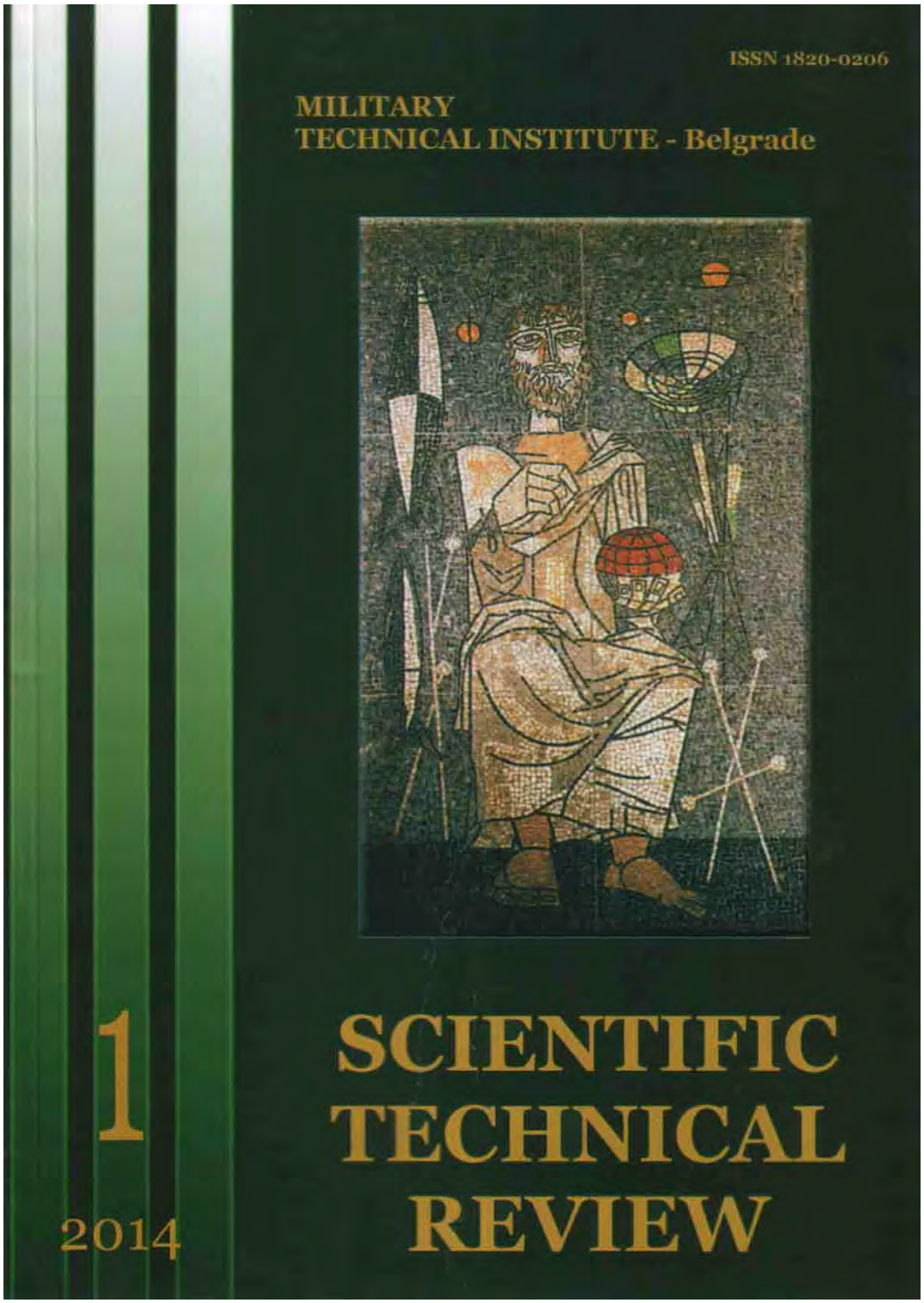
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ГОДИНА
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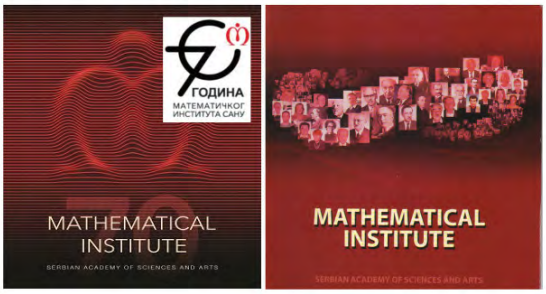
The Colloquium of Mechanics



The Colloquium of Mechanics is one of the two historic colloquiums of MISANU, together with the Colloquium of Mathematics. Its formal and essential role in the organization of the Institute evolved and changed during the past seven decades, along with the changes of the Institute itself.
One of its most distinguished permanent benchmarks and the most important public activity has been the organization of the Mechanics Colloquium. The Mechanics Colloquium has earned reputation of one of the most prestigious regular scientific tribunes in the broad area of Mechanics, with the longest continuous tradition nationwide.
From the founding of MISANU in 1946, there has always been an important group of researchers in the field of Mechanics, whose first leader was the founder and the first director of MISANU, Academician Anton Bilimović.
Up to 1961, the seminar talks in the field of the Mechanics, including Theoretical Mechanics, Dynamics of Fluids, Stability of Motion, Astronomy, were part of the Mathematics Colloquium. According to Academician Konstantin Voronjec, the Head of the Colloquium of Mechanics in 1971, the time of 25th anniversary of the Institute, more than one hundred such talks were held.

The Colloquium of Mechanics was founded in 1961. Until March 2016, there were 1283 meetings of its Mechanics Colloquium. On average, 24 meetings, with about 4-5 foreign speakers are organized annually.

The principal tasks of the Colloquium of Mechanics include:

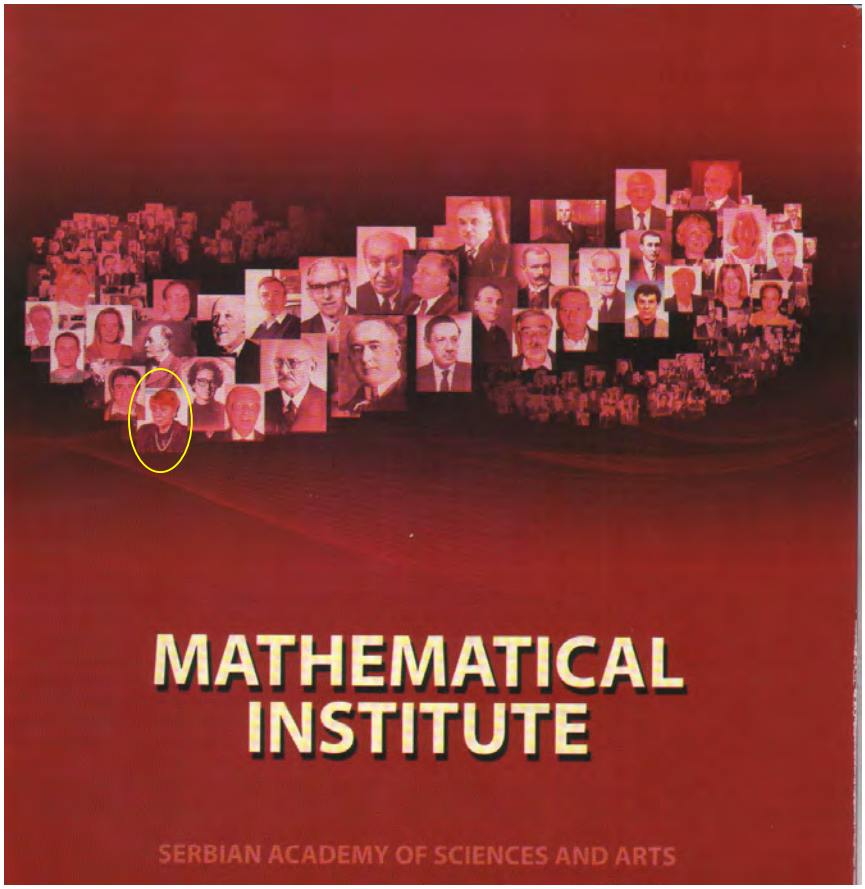
- organization of weekly lectures, the Mechanics Colloquium, which range from expository lectures in pure and applied mechanics to original research reports;
- organization of public presentation and evaluation of scientific projects supported by the Ministry of Science;

Dr. Vlatko Brčić
Chairman of the Colloquium of Mechanics (1973 - 1984)

- supporting and organizing visits of foreign scientists;
- organization and support of workshops, mini conferences, presentations of books, software, video lectures etc;
- monitoring the seminars and other research activities in the field of mechanics within the Institute.

The Mechanics Colloquium meets weekly, keeping the tradition from the very early days of its establishment, on Wednesday at 6 pm. Currently, The Head of the Colloquium of Mechanics is Professor Vladimir Dragović, with Dr. Božidar Jovanović as the Deputy, and Dr. Katarina Kukić as the Secretary.

In the period from 1961 to 1965 the Colloquium of Mechanics Colloquium was headed by academician Tatomir P. Anđelić (1903-1993) and Prof. Danilo Rašković (1910-1985). The Head of the Colloquium of Mechanics from 1965 to 1973 was Academician Konstantin Voronjec (1902-1974); from 1973 to 1984, Prof. Vlatko Brčić (1919-2000); from 1984 to 2000, Prof. Veljko Vujičić; from 2000 to 2006, Academician Vladan Đorđević; from 2006 to 2010, Academician Teodor Atanacković; from 2010 to 2012, Prof. Katica Stevanović Hedrih, and from 2012 Prof. Vladimir Dragović.
In the period from 1975 to 1994, the Secretary of the Colloquium of Mechanics was Dr. Dragi Radojević (1947-2015). From 1994 until 2010, the Secretaries were Dr. Borislav Gajić, Dr. Božidar Jovanović, and Dr. Milena Radnović; from 2010 to 2012, Dr. Srdjan Jović, and from 2012 Dr. Katarina Kukić.



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