

## ODRŽANA JE DEVETA MEĐUNARODNA ŠKOLA MEHANIKE LOMA (IFMASS 9) NINTH INTERNATIONAL FRACTURE MECHANICS SUMMER SCHOOL WAS HELD (IFMASS 9)

Deveta međunarodna letnja škola mehanike loma (IFMASS 9) *Izazovi materijala i zavarenih spojeva: ocena integriteta i veka konstrukcija* održana je ove godine od 19. do 23. septembra u crnomorskom bugarskom letovalištu, Zlatni Pjasci. Stojan Sedmak, jedan od osnivača IFMASS je otvorio Školu i održao prvo predavanje. Posle njega predavanje je održao Stefan Vodeničarov. Za vreme pauze stigao je i Majkl Vnuk (još jedan od utemeljivača Škole), i uveselio prisutne pozdravnim govorom. Ove godine učesnici su imali prilike da obnove osnovna znanje iz mehanike loma, ali i da se upoznaju sa postupcima procene integriteta konstrukcija i načinima prevazilaženja problema sa kojima se suočavamo u radu različitih konstrukcija i postrojenja.

Trećeg dana Škole održana je radionica. Najpre nas je Hans Walter iz berlinskog Fraunhofer instituta sa Odeljenja za mehaničku pouzdanost i mikro materijale je prikazao aktivnosti Instituta i njihove planove u budućnosti, a onda se neočekivano razvila diskusija o Bolonjskoj konvenciji, da li smo počeli da je primenjujemo i kakva su nam prva iskustva. Ispostavilo se da su jedino univerziteti zemalja iz bivše Jugoslavije usvojili i ozbiljno promenili koncept rada, dok su univerziteti u Bugarskoj i Rumuniji, premda na pragu ulaska u EU, još uvek u procesu reforme. Moderator diskusije bila je Donka Angelova, profesor na sofijskom Univerzitetu za hemijsku tehnologiju i metalurgiju. Angelova je predložila, a prisutni predstavnici univerziteta i instituta iz Srbije, Makedonije, Rumunije i Ukrajine rado prihvatili, da se kao rezultat ove razmene iskustava, napiše sporazum o saradnji između univerziteta i instituta zemalja jugoistočne Evrope.

Bilo je reči i o tome da zemlje jugoistočne Evrope treba i mogu da naprave takav naučnotehnički savez koji bi podrazumevao razmenu i fluktuaciju intelektualnih i materijalnih resursa pod daleko povoljnijim uslovima nego kada saraduju pojedinačno sa zapadnim ili američkim institucijama. Sporazum je potpisan (vidi prilog) u nadi da neće ostati samo prazno slovo na papiru.

I tako. Pratili smo osamnaest predavača i isto toliko predavanja, od toga deset srpskih predavača, po dva rumunska i bugarska i po jedan američko, nemačko, ukrajinsko i makedonsko, imali smo tri žene predavača (16, 67%), trojicu mladih predavača, sve njih slušalo je 49, ne uvek prisutnih u sali, održana je jedna radionica, bila je i jedna takozvana svečana večera, Škola imala jednog ali vrednog sponzora, Marina Beloeva, predsednika bugarskih zavarivača, koji je našao vremena i pozdravio skup, i nastavio razgovore o razgranjivanju saradnje. Prvi put u istoriji Škole na kraju deljene diplome učesnicima. Školu zatvorio Dragoslav Šumarac.

U optičaju je CD sa prezentacijama održanih predavanja, a u planu je izdavanje monografije, kao i u prethodnim školama u kojoj će se naći i predavanje francuskog kolege Guy Pluvinaže-a sprečenog da nam se pridruži u Bugarskoj.

Ninth International Fracture Mechanics Summer School (IFMASS 9) *The Challenge of Materials and Weldments: Structural Integrity and Life Assessments* had been held this year, from 19<sup>th</sup> to 23<sup>rd</sup> September in Golden Sand, Bulgarian resort at Black Sea. Stojan Sedmak, one of IFMASS founders, opened the School and held the first lecture. After that, Stefan Vodenitcharov held his lecture. During the break Michael Wnuk (also one of IFMASS founders) arrived and enjoyed participants by his speech of greetings. This year the participants had the occasion to renew their knowledge of Fracture Mechanics fundamentals and to be acquainted with the procedures of structural integrity assessment and ways of solving problems meet in service of different structures and equipment.

On the School third day the workshop was held. Hans Walter from Fraunhofer Institute, Berlin, Department for Mechanical Reliability and Micromaterials, presented the activities off the Institute and their plans in future, and suddenly the discussion turned to Bologna Convention, did we start to apply it and which are first experiences. It turned out that only the Universities from former Yugoslavia accepted and seriously applied working concept, whereas universities in Bulgaria and Romania, although at the entrance in EU, are still in process of reform. Discussion moderator was Donka Angelova, profesor at University of Chemical Technology and Metallurgy in Sofia. Angelova proposed, and the representatives of universities and institutes from Serbia, Macedonia, Romania and Ukraine enthusiastically accepted, to sign the agreement about cooperation between universities and institutes of South-East European countries as a result of exchange of experiences.

There was a discussion whether the countries of South-East Europe can and do such a scientific technical association comprising exchange and fluctuation of intellectual and material resources under much more convenient conditions than in bilateral cooperation with Western or American institutions. The agreement is signed (given enclosed), with the hope that it will not be only a dead letter on the paper.

And so. We followed eighteen lecturers, and the same number of lectures, among them 10 lecturers from Serbia, two from each Bulgaria and Romania, each one from U.S.A., Germany, Ukraine and Macedonia, we had three women as lecturers (16.67%), three young lecturers, with 49 participants not always present in the room, one workshop was held, one so called gall dinner was organized, IFMASS 9 had one, but important sponsor, Martin Beloev, the president of Bulgarian welders, who found the time to greet the participants, and continue the discussion about extension of cooperation. For the first time participants received the certification. Dragoslav Šumarac closed the School.

Compact disc with presentation of lectures is available, and the publication of monograph, as in previous Schools, is in plan, with also the lecture of Guy Pluvinaže, prevented to join us in Bulgaria.

## Održana predavanja - Held lectures

	Predavanje - Lecture	Predavač - Lecturer
<b>A. Osnove – Fundamentals</b>		
1	Problemi prslina u konstrukcijama Crack problems in structures	<b>Stojan. Sedmak</b>
2	Dinamičke karakteristike i otkrivanje oštećenja konstrukcija Dynamical characteristics and structural damage detection	<b>Dragoslav Šumarac,</b> Marina Trajković
3	Matematičko modeliranje loma zavisnog od vremena u savremenim materijalima za avione Mathematical modeling of time-dependent fracture in advanced aerospace materials	<b>Michael Wnuk</b>
4	Savremeni konstrukcijski čelici Advanced structural steels	<b>Nenad Radović</b>
5	Mikromehanička analiza u oceni integriteta konstrukcija Micromechanical analysis in structural integrity assessment	<b>Marko Rakin,</b> Aleksandar Sedmak
6	Energetska analiza $\Delta K$ i $\Delta J$ : zamor – prikaz rezultata Energy analysis of $\Delta K$ and $\Delta J$ : fatigue - data presentations	<b>Donka Angelova</b>
7	Analiza sigurnosti pomoću mehanike loma u nuklearnoj industriji: od osobina materijala do integriteta konstrukcija Fracture mechanics safety analysis in nuclear industry: from material properties to structural integrity	<b>Stevan Vodeničarov</b>
<b>B. Eksperimenti i ispitivanje - Experiments and testing</b>		
8	Saostali naponi od zavarivanja Residual stresses induced by welding	<b>Milorad Zrilić</b>
9	Problemi prslina u zavarenim spojevima Crack problems in welded joints	<b>Katarina Gerić</b>
10	Značaj mehaničkih ispitivanja za integritet konstrukcija Significance of mechanical testing for structural integrity	<b>Vencislav Grabulov,</b> Zijah Burzić
11	Ispitivanja za otkrivanje i ocenu prslina Testing for detection and evaluation of cracks	Miodrag Kirić, <b>Jano Kurai</b>
12	Karakterizacija materijala i ispitivanje zalemljenih spojeva Materials characterization and testing of soldered joints	Berndt Michel, <b>Hans Walter</b>
<b>C. Problemi u eksploataciji - Service problems</b>		
13	Otkaz na povišenoj temperaturi Failure at elevated temperature	<b>Vera Šijački - Žeravčić</b>
14	Faktori intenziteta napona i ocena integriteta mernim trakama i foto elastičnošću Stress intensity factors and integrity assessment by strain gauges and photo elasticity	<b>Dan Constantinescu</b>
<b>D. Ocena integriteta konstrukcija - Structural integrity assessment</b>		
15	Numerička analiza zavarenih konstrukcija za ocenu integriteta konstrukcije Numerical analysis of welded structures for structural integrity assessment	Aleksandar Sedmak, <b>TaškoManeski</b>
16	Metodologija termoelastičnosti za ocenu integriteta konstrukcije Thermo elastic methodology for structural integrity assessment	<b>Liviu Marşavina</b>
17	Model za proračun graničnog opterećenja pri duktilnom lomu oštećenih cevi i posuda pod pritiskom Limit load calculation model of ductile failure of defective pipe and pressure vessel	<b>Igor Orynyak</b>
18	Postupci ocene integriteta konstrukcija i njihova primena Structural integrity assessment procedures and their application	<b>Gorgi Adžiev</b>

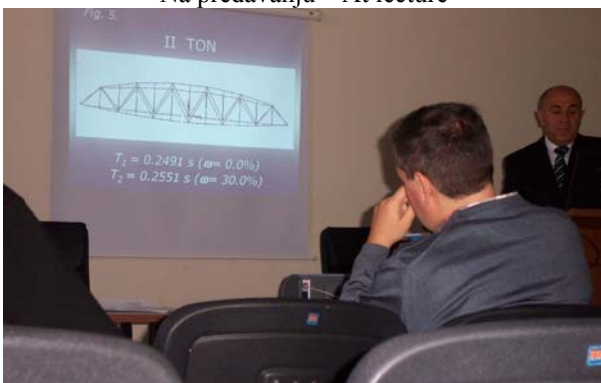
Slike sa IFMASS 9 – Figure from IFMASS 9



Na predavanju – At lecture



Na pauzi – Coffee break



Predavanje D. Šumarca – Lecture of D. Šumarac



Predavanje Majkla Vnuka – Lecture of Michael Wnuk



Donka Angelova, Stojan Sedmak, Michael Wnuk



Michael Vnuk, Martin Beloev, Donka Angelova, Dragoslav Šumarac, Ljubica Milović



Na ekskurziji – At the trip



Deo učesnika – Part of participants



## SOCIETY for STRUCTURAL INTEGRITY and LIFE

11000 Beograd, Bulevar vojvode Mišića 43, soba 258

Tel. 011 – 2650 322 lok. 202 Fax. 011 – 369 2772 E mail: sedmak@divkorg.yu

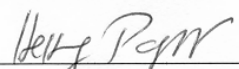
Golden Sands, Bulgaria, 21. september 2005.

Today, at the workshop of IFMASS 9, we, the representatives of organiser comity of IFMASS 9


1. Nenad Radović-Faculty of Technology and Metallurgie, University of Belgrade, Serbia&Montenegro; nenrad@tmf.bg.ac.yu
2. Gorgi Adžiev-Institute for Welding and Welded Structures from the Faculty of Mechanical from the Faculty of Mechanical Engineering of Skopje, Macedonia; gadziev@mf.ukim.edu.mk
3. Dan Contantinescu-Politechnical University of Bucharest, Department of Strength of Materials, Romania; dancon1@form.resist.pub.ro
4. Liviu Marşavina- Polytechnic University of Timișoara; msvina@linux1.mec.utt.ro
5. Donka Angelova- University of Chemical Technology and Metallurgy, Faculty of Metallurgy and Materials, Sofia, Bulgaria; dona\_ang@techno-link.com
6. Stefan Vodenicharov-Bulgarian Academy of Sciences, Institute of Metal Science, Sofia, Bulgaria; stvims@ims.bas.bg
7. Igor Orynyak-Institut "Paton", Ukrainian Academy of Sciences, Kiev, Ukraine; or@ipp.kiev.ua *FOR PROBLEMS OF STRENGTH*
8. Dragoslav Šumarac-Faculty of Civil Engineering, University of Belgrade, Serbia&Montenegro; sumi@eunet.yu
9. Stojan Sedmak-President of Society for Structural Integrity and Life, Belgrade, Serbia&Montenegro; sedmak@divk.org.yu

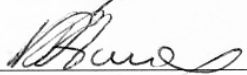
Agreed to establish an alliance between the universities of southeast European countries named SOUTHEAST EUROPEAN FORUM FOR STRUCTURAL INTEGRITY.

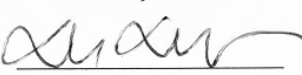
The members of Alliance agree to sign a written document outlining the programme of future cooperation.

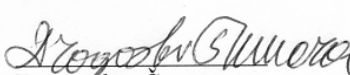
  
Nenad Radović

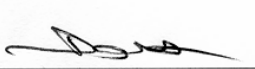
  
Liviu Marşavina


  
Igor Orynyak


  
Gorgi Adžiev

  
Donka Angelova

  
Dragoslav Šumarac


  
Dan Contantinescu

*for*   
Stefan Vodenicharov

  
Stojan Sedmak

*We, representative of BWS, agree to take part in this alliance*

  
Dr. eng. MARIN BELDEV

  
Assoc. Prof. Dr. Peter Ovcharov