

University of Niš  
Faculty of Mechanical Engineering



## PROGRAM

# XVI SCIENTIFIC-EXPERT CONFERENCE ON RAILWAYS RAILCON '14



October 09 - 10, 2014, Niš, Serbia



- ① Faculty of Mechanical Engineering
- ② Downtown
- ③ Bus Station
- ④ Fortress
- ⑤ University of Niš

**The XVI Conference RAILCON '14  
Faculty of Mechanical Engineering,  
Aleksandra Medvedeva 14, Niš, Serbia  
(GPS: 43°19'49.7"N+21°53'42.6"E)**



The Faculty of Mechanical Engineering Niš, Serbia wishes you a pleasant welcome to the

### **INTERNATIONAL XVI SCIENTIFIC-EXPERT CONFERENCE ON RAILWAYS - RAILCON '14.**

The Conference on Railways continues the tradition and this year it is its sixteenth anniversary. Its mission is to bring together scientists and experts from the region, to observe the ongoing changes in developed railways and suggest directions for further railway development in Serbia and the region.

According to this year's Conference Program there are 74 papers written by 153 authors from Railway, University and Industry, from 10 countries, dealing with actual topics from fields of rolling stock, traffic, infrastructure, maintenance, informatics, economics, strategy, policy and other aspects related to Railway.

On the occasion of 130 years of Railways in Serbia, RAILCON presents the book The Railways of Southeast Serbia 1884–2014.

We would specially recommend marketing presentations of 7 companies from 5 countries, cofinanciers of the Conference.

We wish the participants a successful event and a pleasant stay in Niš.

#### **Organizing Committee of RAILCON '14**

##### **Patrons**

Ministry of Education, Science and Technological Development of the  
Republic of Serbia  
JSC SERBIAN RAILWAYS  
MIN Lokomotiva a.d.

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STADLER  
ALTPRO d.o.o.  
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THALES  
OPEN TRACK

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Prof. Vlastimir Nikolić, Fac.of Mech.Eng. Niš, SRB  
Rešad Nuhodžić, PhD, Ministry of Transport and Maritime Affairs, MNE  
Nena Tomović, MSc, JSC Serbian Railways, SRB  
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Prof. Snežana Pejčić Tarle, Fac. of Traffic Eng. Belgrade, SRB  
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Predrag Milić  
Dušanka Nikolić  
Vesna Grozdanović

# PROGRAM

THURSDAY, October, 09 2014

8<sup>30</sup> – *Application of Participants*  
(Lobby)

10<sup>00</sup> – 10<sup>45</sup> *Opening Ceremony*  
(Amphitheatre A)

10<sup>45</sup> – 11<sup>30</sup> *Welcome Cocktail*  
(Lobby)

11<sup>30</sup> – 13<sup>00</sup> *Plenary Session*  
(Amphitheatre A)

*Chairmen:*

*Prof. Vlastimir Nikolić, Prof. Zdenka Popović, Prof. Miloš Milošević*

- PRECEDENT-FREE FAULT LOCALIZATION FOR HIGH SPEED TRAIN DRIVE SYSTEMS  
Asad UL HAQ, Dragan ĐURĐANOVIĆ  
University of Texas at Austin, Austin, USA
- IMPROVING SERBIAN RAILWAYS: POLICY OPTIONS AND STRATEGIC DIRECTIONS  
Nena TOMOVIĆ, JSC Serbian Railways, Serbia  
Snežana PEJČIĆ TARLE,  
Faculty of Transport and Traffic Engineering, Belgrade, Serbia
- IMPORTANCE OF COTIF TO INTERNATIONAL TRAFFIC  
Bas LEERMAKERS, Dragan NEŠIĆ  
OTIF, Bern, Switzerland
- Promotion of the historical publication  
*The Railways of Southeast Serbia 1884–2014*  
Promoter: Slobodan ROSIĆ, Belgrade, Serbia

13<sup>00</sup> – 13<sup>15</sup> *Commercial Presentations*  
(Amphitheatre A)

- STADLER

13<sup>15</sup> – 15<sup>30</sup> *Break*

15<sup>30</sup> – 17<sup>00</sup> *Session 1 - Rolling stock I*  
(Amphitheatre B)

*Chairmen:*

*Privatdoz. Andreas Schoebel, Prof. Nenad T. Pavlović*

- 1.1. EXPERIMENTAL RESEARCH OF CHARACTERISTICS OF IMPROVED TYPE OF COMBINED TUBE ENERGY ABSORBER  
Jovan Tanasković, Dragan MILKOVIĆ,  
Vojkan LUČANIN, Žarko MIŠKOVIĆ,  
Faculty of Mechanical Engineering, Bgrade, Serbia
- 1.2. HYBRIDIZATION- THE WAY OF DECREASING CARBON DIOXIDE EMISSION AND FUEL ECONOMY  
Martin MIKOLAJČÍK, Daniel KALINČÁK,  
Univerzity of Žilina, Slovakia
- 1.3. NEW STADLER “FLIRT3” EMU’S FOR SERBIAN RAILWAYS  
Fadi KHAIRALLAH,  
StadlerBussnangAG, Bussnang, Switzerland
- 1.4. REQUIREMENTS FOR CUSTOMER FRIENDLY RAILWAY INTERIORS  
Bernhard RÜGER, Vienna University of Technology, Vienna, Austria
- 1.5. EXPERIMENTAL MEASUREMENTS AND NUMERICAL SIMULATIONS OF THE WHEEL-RAIL ANGLE OF ATTACK  
Dragan MILKOVIĆ, Goran SIMIĆ,  
Jovan TANASKOVIĆ, Živana JAKOVLJEVIĆ,  
Faculty of Mechanical Engineering, Belgrade, Serbia
- 1.6. DETERMINATION OF FRICTION HEAT GENERATION IN CONTACT OF WHEEL-RAIL SET USING FEM  
Aleksandar MILTENOVIĆ, Milan BANIĆ, Dušan STAMENKOVIĆ,  
Miloš MILOŠEVIĆ, Miša TOMIĆ,  
Faculty of Mechanical Engineering, Niš, Serbia
- 1.7. ANALYSIS OF THE RESULTS OF THEORETICAL AND EXPERIMENTAL STUDIES OF FREIGHT WAGON FALS  
Svetoslav SLAVCHEV, Kalina GEORGIEVA,  
Valeri STOILOV, Sanel PURGIĆ,  
Technical University, Sofia, Bulgaria

**15<sup>30</sup> – 17<sup>00</sup> Session 4 – Vehicle and infrastructure maintenance**  
(Ceremonious Room)

*Chairmen:*

*Prof. Dragan Petrović, Prof. Dragan Milčić*

- 4.1. REPAIRING OF BROKEN LAMINATED SPRINGS OF FREIGHT WAGONS BY WELDING  
Dragan PETROVIĆ, Milan BIŽIĆ,  
Faculty of Mechanical and Civil Engineering, Kraljevo, Serbia
- 4.2. DATABASE TO SUPPORT OPTIMIZATION OF ROLLING STOCK MAINTENANCE IN SERBIAN RAILWAYS  
Slađana JANKOVIĆ,  
Faculty of Transport and Traffic Engineering, Belgrade, Serbia  
Života ĐORĐEVIĆ, JSC Serbian Railways, Belgrade, Serbia  
Irina BRANOVIĆ, IEEE Member  
Snježana RAJILIĆ, Municipal Novi Grad, Novi Sad, Serbia  
Slavko VESKOVIĆ,  
Faculty of Transport and Traffic Engineering, Belgrade, Serbia
- 4.3. FIRST RESULTS OF THE CHANGE OF THE CRITERIA FOR REGULAR REPAIRS OF SERIES 441 TRACTION VEHICLES  
Dragan B. RAJKOVIĆ,  
JSC Serbian Railways, Novi Sad, Serbia
- 4.4. METHODOLOGIES OF EXPERIMENTAL DETERMINATION OF WHEEL-RAIL CONTACT FORCES  
Milan BIŽIĆ, Dragan PETROVIĆ,  
Faculty of Mechanical and Civil Engineering, Kraljevo, Serbia
- 4.5. DAMAGES OF RAILWAY INFRASTRUCTURE INDUCED BY CORROSION  
Dušan PETKOVIĆ, Goran RADENKOVIĆ,  
Faculty of Mechanical Engineering, Niš, Serbia  
Jelena DIMITRIJEVIĆ,  
Faculty of Civil Engineering, Niš, Serbia
- 4.6. MEASUREMENT OF WIRE PRESTRESSING FORCE TO QUALITY OF CONCRETE SLEEPERS  
Slobodan JOVANOVIĆ, Dragan S. JOVANOVIĆ,  
Faculty of Mechanical Engineering, Niš, Serbia  
Slaviša PLANIĆ, DIV Concrete sleepers LTD. Svrlijig, Serbia

- 4.7. THE THERMAL ELASTIC BEHAVIOR OF THE CYLINDRICAL ROLLER BEARING FOR RAILWAY VEHICLES  
Vladimir BLANUŠA, Milan ZELJKOVIĆ, Aleksandar ŽIVKOVIĆ,  
Faculty of Technical Sciences, Novi Sad, Serbia

**17<sup>00</sup> – 17<sup>15</sup> Coffee Break**  
(Lobby)

**17<sup>15</sup> – 18<sup>45</sup> Session 1 - Rolling stock II**  
(Amphitheatre B)

*Chairmen:*

*Prof. Kiril Velkov, Prof. Vojkan Lučanin*

- 1.8. ABOUT THE PROCESS OF BRAKED WEIGHT LOSS IN THE FREIGHT TRAINS  
Kiril VELKOV, Oleg KRASTEVA, Sanel PURGIĆ,  
Technical University, Sofia, Bulgaria
- 1.9. ISSUES OF WAGON MODELLING WITH SHELL ELEMENTS  
Svetoslav SLAVCHEV, Kalina GEORGIEVA, Valeri STOILOV,  
Technical University, Sofia, Bulgaria
- 1.10. FRICTION CHARACTERISTICS OF THE FRICTION PAIRS IN DISC BRAKES  
Vasko NIKOLOV,  
Todor Kableshkov University of Transport, Sofia, Bulgaria
- 1.11. ENERGY ANALYSIS OF FRACTIONAL ORDER OSCILLATIONS OF A COMPOSITION OF THE TRAIN BY A CHAIN MODEL OF FRACTIONAL ORDER PROPERTIES  
Katica R. (Stevanović) HEDRIH,  
Department for Mechanics of Mathematical Institute SANU, Belgrade,  
Faculty of Mechanical Engineering, Niš, Serbia
- 1.12. BAGGAGE TRANSPORT SYSTEM – NEW SOLUTION  
Bernhard RÜGER,  
Vienna University of Technology, Vienna, Austria
- 1.13. PESA 122NASF SWING - THE NEW TRAMS IN SOFIA  
Zornitsa EVLOGIEVA, Emil M. MIHAYLOV,  
Todor Kableshkov University of Transport, Sofia, Bulgaria

1.14. HYBRID INTELLIGENT VIBRATION CONTROL OF RAIL CAR BODY WITH PIEZO ACTUATORS  
 Žarko ČOJBAŠIĆ, Vlastimir NIKOLIĆ, Emina PETROVIĆ,  
 Ivan ĆIRIĆ, Ivan PAVLOVIĆ,  
 Faculty of Mechanical Engineering, Niš, Serbia

**17<sup>15</sup> – 18<sup>45</sup> Session 2 - Traffic and Transport I**  
 (Ceremonious Room)

*Chairmen:*

*Prof. Dragutin Kostić, Prof. Boban Anđelković*

- 2.1. ASSESSING ACCIDENT SEVERITY RISK AT RAILWAY CROSSINGS IN SERBIA BY USING A MULTINOMIAL LOGIT MODEL  
 Sandra KASALICA, Dušan JEREMIĆ,  
 Marko BURSAC, Goran TRIČKOVIĆ,  
 The Railway College of Vocational Studies, Belgrade, Serbia
- 2.2. ANALYSIS OF RAIL AND ROAD INFRASTRUCTURE FOR POSSIBLE USE OF CAR HANDLING SYSTEMS  
 Vladimir REDŽOVIĆ,  
 WAM Planer und Ingenieure AG, Solothurn, Switzerland
- 2.3. MODELLING AND DESIGN FACILITIES FOR DEALING WITH DANGEROUS GOODS ON RAILWAY  
 Slavko VESKOVIĆ,  
 Faculty of Transport and Traffic Engineering, Belgrade, Serbia  
 Goran MAKSIĆ, JSC Serbian Railways, Belgrade, Serbia  
 Marko VASILJEVIĆ, Faculty of Traffic and Transport Engineering,  
 Doboj, Bosnia and Herzegovina  
 Gordan STOJIC,  
 Faculty of Technical Sciences, Novi Sad, Serbia  
 Snježana RAJILIĆ,  
 Municipal Novi Grad, Novi Sad, Serbia
- 2.4. RAILWAY TRAFFIC IN SUSTAINABLE ENVIRONMENTAL DEVELOPMENT AND ENERGY EFFICIENCY  
 Predrag PETROVIĆ, Marija PETROVIĆ, Slobodan VUKMIROVIĆ,  
 Institute "KiriloSavić", Belgrade, Serbia  
 Živojin PETROVIĆ,  
 Faculty of Mechanical Engineering, Belgrade, Serbia

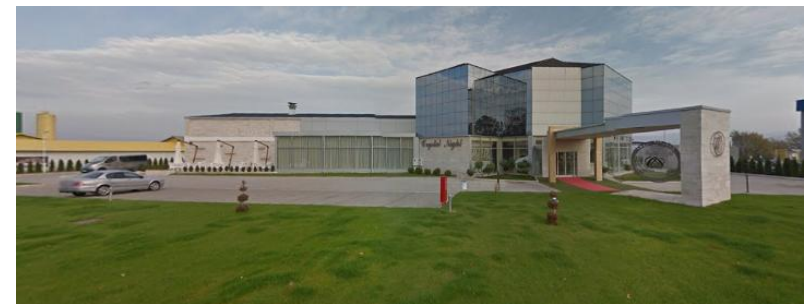
- 2.5. SELECTION OF RAILWAY LEVEL CROSSINGS FOR INVESTING IN SECURITY EQUIPMENT USING HYBRID DEMATEL-MARIC MODEL  
 Dragan PAMUČAR, Ljubislav VASIN, Vesko LUKOVAC,  
 Military academy, Belgrade, Serbia
- 2.6. ON VALIDITY OF INTRODUCING THE ENERGY METERS ON ELECTRIC TRACTION UNITS  
 Slobodan ROSIĆ, JSC Serbian Railways, Belgrade, Serbia  
 Dragutin KOSTIĆ,  
 Faculty of Transport and Traffic Engineering, Belgrade, Serbia
- 2.7. A COMPARISON OF DRIVER BEHAVIOR AT RAILWAY CROSSING WITH PASSIVE AND ACTIVE PROTECTION SYSTEMS  
 Sandra KASALICA, Goran TRIČKOVIĆ,  
 Dušan JEREMIĆ, Marko BURSAC,  
 Railway College of Vocational Studies
- 2.8. RANKING OF HEADWAYS PRIORITY IN RAILWAY TIMETABLE  
 Predrag JOVANOVIĆ, Dragomir MANDIĆ,  
 Faculty of Transport and Traffic Engineering, Belgrade, Serbia  
 Dragan IVANOVIĆ, Belgrade, Serbia

**19<sup>30</sup> Dinner Party**

(Restaurant *Crystal light*)

(Dimitrija Tucovića 186, Niš)

(GPS: 43°19'00.6"N+21°50'55.1"E)



FRIDAY October, 10 2014

**9<sup>00</sup> – Application of Participants  
(Lobby)**

**9<sup>15</sup> – 11<sup>15</sup> Session 3 / 5  
Infrastructure I / Strategy and Policy I  
(Amphitheatre B)**

*Chairmen:*  
*Prof. Zdenka Popović, dr Aleksandar Miltenović*

- 3.1. THE ORGANIZATION OF CONSTRUCTION WORKS UNDER TRAFFIC ON OVERHAUL OF RAILWAY SECTION DOBOJ – KM 103+500  
Ljuban JEROSIMIĆ, Tatjana MIKIĆ, Tatjana SIMIĆ,  
CeS COWI, Belgrade, Serbia
- 3.2. WATERPROOFING OF CONCRETE BRIDGE – GENERAL CHARACTERISTICS AND REQUIREMENTS  
Nikolina POROJANOVA, Snejana VALKOVA,  
Todor Kableshev University of Transport, Sofia, Bulgaria
- 3.3. EXTENSION OF ARCHITECTURAL CONTENT ON PASSENGER STATIONS AND SPECIAL REQUIREMENTS IN CIVIL ENGINEERING AND INFRASTRUCTURE PLANNING  
Tomasz REMUS,  
WAM Planer und Ingenieure AG, Solothurn, Switzerland
- 3.4. DESIGN SOLUTION OF CONTAINER TERMINAL WAREHOUSE CASE OF FREE ZONE CITY OF NIŠ  
Vojislav TOMIĆ, Miloš MADIĆ, Boban NIKOLIĆ,  
Faculty of Mechanical Engineering, Niš, Serbia
- 5.1. QUANTIFYING LANDSCAPE FRAGMENTATION DUE TO RAIL INFRASTRUCTURE  
Nataša BOJKOVIĆ, Marijana PETROVIĆ, Snežana PEJČIĆ TARLE,  
Faculty of Transport and Traffic Engineering, Belgrade, Serbia
- 5.2. IMPROVING QUALITY OF SERVICE FOR PEOPLE WITH DISABILITIES IN RAILWAY TRANSPORT  
Dragan ĐORĐEVIĆ,  
Institute of Transportation CIP, Belgrade, Serbia

- 5.3. DATA DRIVEN MODEL FOR PREDICTION OF RAIL TRAFFIC  
Luka LAZAREVIĆ, Miloš KOVAČEVIĆ, Zdenka POPOVIĆ,  
Faculty of Civil Engineering, Belgrade, Serbia

- 5.4. HOW TO EVALUATE BODIES FOR RAILWAY MARKET REGULATION  
Branislav BOŠKOVIĆ,  
Faculty of Transport and Traffic Engineering, Belgrade, Serbia  
Danijela ĐORIĆ, Serbia  
Nataša CERVIĆ, Directorate for Railways, Belgrade, Serbia

- 5.5. APPLICATION OF GROUP DECISION MAKING APPROACH FOR RESTRUCTURING RAILWAYS TOWARDS SUSTAINABILITY  
Boban ĐORĐEVIĆ, Tanja PAREZANOVIĆ, Snežana PEJČIĆ TARLE,  
Faculty of Transport and Traffic Engineering, Belgrade, Serbia  
Nena TOMOVIĆ, JSC Serbian Railways, Belgrade, Serbia  
Nikola PETROVIĆ,  
Faculty of Mechanical Engineering, Niš, Serbia

- 5.6. SELECTION OF THE LOCOMOTIVE SERIES APPROPRIATE FOR MODERNIZATION BASED ON MULTI-CRITERIA ANALYSIS  
Oleg KRASTEVIĆ, Kiril VELKOV, Mario KRASTEVIĆ,  
Technical University, Sofia, Bulgaria

**9<sup>15</sup> – 11<sup>15</sup> Session 6 - Other Railway aspects I  
(Ceremonious Room)**

*Chairmen:*  
*Prof. Branislav Bošković, Prof. Dušan Stamenković*

- 6.1. RISK MANAGEMENT CAPABILITIES IN RAIL TRANSPORT UNDER SEVERE WEATHER CONDITIONS  
Dragutin JOVANOVIĆ, Vujadin VEŠOVIĆ,  
Faculty of Transport, Communic. and Logistics, Berane, Montenegro  
Branko BABIĆ,  
Technical College of Vocational Studies, Novi Sad, Serbia  
Nebojša ČURČIĆ,  
College of Vocational Studies - Belgrade Polytechnics, Belgrade, Serbia
- 6.2. DISCUSSION ON AUCTIONS AND POSSIBILITY OF THEIR APPLICATION IN RAILWAY  
Nikola STOJADINOVIĆ, Branislav BOŠKOVIĆ,  
Faculty of Transport and Traffic Engineering, Belgrade, Serbia



**6.3. RAILWAY ENGINEERING EDUCATION**

Dušan STAMENKOVIĆ,  
Faculty Of Mechanical Engineering, Niš, Serbia  
Dragomir MANDIĆ,  
Faculty Of Transport And Traffic Engineering, Belgrade, Serbia

**6.4. THE ROLE AND COMPETENCIES OF REGULATORY BODY ACCORDING TO THE LAW ON RAILWAYS**

Branka NEDELJKOVIĆ, Zorica RADOVIĆ,  
Directorate for Railways, Belgrade, Serbia

**6.5. CURRENT PROBLEMS OF CROSSING THE RAILWAY DURING THE CONSTRUCTION AND OPERATION OF THE HIGHWAYS ON CORRIDOR 10**

Aleksandar NAUMOVIĆ, "Corridors of Serbia", Belgrade, Serbia  
Sinisa MARIĆ, JSC Serbian Railways, Belgrade, Serbia  
Predrag ATANASKOVIĆ,  
Faculty of Technical Sciences, Novi Sad, Serbia

**6.6. IMPORTANCE OF PASSENGER RAILWAY TRAFFIC IN DEFINING CRITERIA TRANSPORT ACCESSIBILITY OF THE AREAS OF DANUBE DISTRICTS**

Ana VULEVIĆ, Dragan ĐORĐEVIĆ,  
Institute of Transportation CIP, Belgrade, Serbia

**6.7. ACTIONS TAKEN ON RAILWAYS IN STIMULATING OF TRANSPORT OF PASSENGERS WITH SPECIAL NEEDS**

Zoran PAVLOVIĆ,  
JSC Serbian Railways, Belgrade, Serbia

**6.8. RAILWAY LINES FOR FAST TRAINS IN JAPAN**

Jelena DIMITRIJEVIĆ, Faculty of Civil Engineering, Niš, Serbia  
Dušan PETKOVIĆ, Faculty of Mechanical Engineering, Niš, Serbia

**6.9. REMOVING OF RELEASING PROBLEM OF FREIGHT CARS OPERATING IN SS REGIME WITH INSTALLING OF BY/PASS**

Erdinč RAKIPOVSKI, Skopje, Macedonia  
Dragan MILČIĆ, Faculty of Mechanical Engineering, Niš, Serbia

**11<sup>15</sup> – 11<sup>45</sup> Poster Presentation / Coffee Break  
(Lobby)****P.1. TESTING OF THE DYNAMICAL BEHAVIOUR IN RUNNING CONDITION OF THE NEW DMU FOR THE SERBIAN RAILWAYS**

Milutin KRIVOKAPIC, Marija VUKŠIĆ-POPOVIĆ,  
Saša RADULOVIĆ, Borisav BOGDANOVIĆ,  
Institute "KiriloSavić", Belgrade, Serbia

**P.2. THE POSSIBILITY OF USING A SUPPLEMENTARY COMPONENT FOR THE COMBUSTION EFFICIENCY OF LOCOMOTIVE DIESEL ENGINES**

Miloš MILOŠEVIĆ, Faculty of Mechanical Engineering, Niš, Serbia  
Jovica PEŠIĆ, Linex, Pirot, Serbia  
Ljubiša TJUPA, Eš MijaStanimirović, Niš, Serbia  
Boban NIKOLIĆ, Vojislav TOMIĆ,  
Faculty Of Mechanical Engineering, Niš, Serbia

**P.3. COMPARISON OF THE OPERATING PROPERTIES OF COMPOSITE ORGANIC RAILWAY BRAKE BLOCKS WITH CAST IRON BRAKE BLOCKS P10**

Daniel KALINČÁK, Rudolf ŘEZNÍČEK, Martin MIKOLAJČÍK,  
Univerzityof Žilina, Slovakia

**P.4. RISK ANALYSIS OF DELAY OF PASSENGER TRAINS IN THE RAIL NETWORK**

Svetla STOILOVA,  
Technical University, Sofia, Bulgaria

**P.5. INFRASTRUCTURE OF URBAN RAIL SYSTEMS**

Ivana VICENTIĆ,  
EnCon doo, Belgrade, Serbia  
Zdenka POPOVIĆ  
Faculty of Civil Engineering, Belgrade, Serbia

**P.6. THE ISSUE OF PERFORMANCE MANAGEMENT SUCCESS IN SERBIAN RAILWAYS COMPANY**

Aleksandar BLAGOJEVIĆ, JSC Serbian Railways, Novi Sad, Serbia  
Radmila ČURČIĆ,  
High School of Professional Studies for Traffic Management, Niš, Serbia

**P.7. THE EFFECT OF AGING TEMPERATURE ON SILICA REINFORCED POLYISOPRENE/ CHLOROSULPHONATED POLYETHYLENE RUBBER BLEND IN RAILWAY INDUSTRY**  
 Gordana MARKOVIĆ, Tigar, Pirot, Serbia  
 Milena MARINOVIC-CINCOVIĆ,  
 Institute of Nuclear Science Vinča, Belgrade, Serbia  
 Vojislav JOVANOVIĆ, Suzana SAMARŽIJA-JOVANOVIĆ,  
 Faculty of Natural Science and Math., Priština (K. Mitrovica), Serbia  
 Jaroslava BUDINSKI-SIMENDIĆ,  
 Faculty of Technology, Novi Sad, Serbia

**11<sup>45</sup> – 13<sup>30</sup> Session 2 / 6**  
**Traffic and Transport II / Other Railway aspects II**  
*(Amphitheatre B)*

*Chairmen:*

*Prof. Daniel Kalinčak, Prof. Snežana Pejčić Tarle*

- 2.9. APPLICATION OF OPENTRACK AT RAILWAY PROJECTS IN AUSTRIA**  
 Andreas SCHÖBEL,  
 OpenTrack Railway Technology GmbH, Vienna, Austria
- 2.10. SIMULATION MODELLING OF TECHNOLOGICAL PROCESSES IN SUBWAY STATION**  
 Svetla STOILOVA, Veselin STOEV,  
 Technical University, Sofia, Bulgaria
- 2.11. MULTICRITERIA SUSTAINABILITY EVALUATION OF TRANSPORT MODES**  
 Nikola PETROVIĆ, Vesna JOVANOVIĆ,  
 Faculty of Mechanical Engineering, Niš, Serbia  
 Jelena PETROVIĆ, Mladen MITROVIĆ,  
 Faculty of Science and Mathematics, Niš, Serbia
- 6.10. ANALYSIS OF LIFE CYCLE COSTS AND PROFITS OF TRAMS IN SLOVAKIA**  
 František RUMAN, Juraj GREŇČÍK,  
 Univerzity of Žilina, Slovakia

- 6.11. DESIGN OF A DISTRIBUTED SYSTEM FOR MONITORING ENERGY CONSUMPTION OF ELECTRIC-TRACTION VEHICLES BASED ON GPRS-INTERNET**  
 Nenad JEVTIĆ, Dragutin KOSTIĆ,  
 Slobodan MITROVIĆ, Petar MARKOVIĆ,  
 Faculty of Transport and Traffic Engineering, Belgrade, Serbia
- 6.12. APPLICATION OF THE MOBILE MACHINES IN RAILWAY TRANSPORT**  
 Dragoslav JANOŠEVIĆ, Jovan PAVLOVIĆ, Vesna JOVANOVIĆ,  
 Faculty of Mechanical Engineering, Niš, Serbia
- 6.13. INVESTIGATING THE GROUND BASE ALONG A DEFORMED SECTION OF THE SILISTRA-ALFATAR RAILWAY (BULGARIA)**  
 Vanushka PETROVA,  
 Geological Institute – Bulgarian Academy of Sciences, Sofia, Bulgaria  
 Zornitsa EVLOGIEVA,  
 TodorKableshkov University of Transport, Sofia, Bulgaria
- 6.14. A PROPOSAL OF LED MODULE DESIGN IN RAILWAY SIGNALS**  
 Ranko BABIĆ,  
 The Railway College of Vocational Studies, Belgrade, Serbia
- 6.15. APPLICATIONS OF FBG SENSOR SYSTEM FOR TRAIN AXLE COUNTING IN RAILWAY**  
 Ivan STANKOVIĆ, Nenad T. PAVLOVIĆ,  
 Faculty of Mechanical Engineering, Niš, Serbia

**11<sup>45</sup> – 13<sup>30</sup> Session 1 / 3**  
**Rolling stock III / Infrastructure II**  
*(Ceremonious Room)*

*Chairmen:*

*Prof. Dragomir Mandić, Prof. Vojislav Miltenović*

- 1.15. 30 YEARS OF THE EXPLOITATION OF LOCOMOTIVES TYPE DVM12**  
 Marko ĐUKIĆ,  
 JSC Serbian Railways, Belgrade, Serbia



- 1.16. THE INFLUENCE OF THE RAILWAY FLEET MODERNIZATION ON THE ENERGY EFFICIENCY  
Igor KORUNOSKI, Kire DIMANOSKI, Gligorche VRTANOSKI,  
Macedonian Railways Transport JSC, Skopje, Macedonia
- 1.17. MEASURING ACCELERATIONS FRAME TRAM BOGIES T81 IN ORDER TO ESTABLISH THE REASONS FOR THE EMERGENCE AND DEVELOPMENT OF CRACKS  
Emil M. MIHAYLOV, Emil IONTCHEV, Dobrinka ATMADZHOVA,  
Todor Kableshkov University of Transport, Sofia, Bulgaria
- 1.18. THE BULGARIAN STATE RAILWAYS EXPERIENCE IN DETERMINING FATIGUE STRENGTH OF ROLLING STOCK STRUCTURES  
Dobrinka ATMADZHOVA,  
Todor Kableshkov University of Transport, Sofia, Bulgaria
- 3.5. MODULAR MICROPROCESSOR LEVEL CROSSING PROTECTION SYSTEM TYPE RLC23 FOR SAFETY INTEGRITY LEVEL SIL4  
Zvonimir VIDUKA, Darko BARIŠIĆ,  
ALTPRO, Zagreb, Croatia
- 3.6. TOOLS FOR TRANSITION CURVE DESIGN - APPLICATION FOR RAILWAY RECONSTRUCTION  
Luka LAZAREVIĆ, Zdenka POPOVIĆ, Milica VILOTIJEVIĆ,  
Faculty of Civil Engineering, Belgrade, Serbia
- 3.7. AUTHORISATION FOR PLACING IN SERVICE OF STRUCTURAL SUBSYSTEMS PRESENTED ON THE EXAMPLE OF THE SUBSYSTEM "INFRASTRUCTURE"  
Mirjana DŽUDOVIĆ, Milan POPOVIĆ,  
Directorate for Railways, Belgrade, Serbia  
Dragana JOKANOVIĆ, JSC Serbian Railways, Belgrade, Serbia

**13<sup>30</sup> Conference Closing**

### *Conference Fee*

The Registration Fees for the participants are:

- **9600 RSD** (8000 RSD + 20% VAT) or **84 EUR**

A participant with a paid registration fee is eligible for the attendance at the Conference, Proceedings, other Conference materials and Dinner Party.

The Registration fee is payable by bank transfer to the account of the Conference according to the payment instructions that can be found on the web site of the Conference and in cash at the Registration Desk during the Conference.

### *Application of Participants*

For the purpose of successful organization of the International XV Scientific-expert Conference on Railways RAILCON '14 potential participants are asked to apply their participation on time. We suggest doing that by submitting the filled *Participation Registration Form*, which can be found on the web site of the Conference, to the e-mail address of the Conference Organizer.

### *Selected papers*

Selected presented papers will be published in a thematic issue of the International Journal of the University of Niš FACTA UNIVERSITATIS – Series: Mechanical Engineering:

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