



JUGOSLOVENSKO DRUŠTVO ZA MOTORE I VOZILA
YUGOSLAV SOCIETY OF AUTOMOTIVE ENGINEERS

Medjunarodni naučno-stručni skup

XXV NAUKA I MOTORNA VOZILA 2015 **SCIENCE AND MOTOR VEHICLES 2015**

JUMV International Automotive Conference

Automotive Engineering for Improved Safety

PRELIMINARY PROGRAMME

14 - 15 April 2015, Beograd, Serbia



Patronage of



Welcome to Belgrade

Maintaining the tradition, JUMV is organizing the 25th International Automotive Conference **SCIENCE AND MOTOR VEHICLES** in Belgrade, on 14-15 April 2015 under the motto

AUTOMOTIVE ENGINEERING FOR IMPROVED SAFETY.

The Automotive Conference "Science and Motor Vehicles" was established in 1967 and has since become an important international forum of Automotive Engineers in Serbia, Balkans and Central-Eastern Europe. It promotes the exchange of engineering and scientific knowledge and experience at the highest quality level between experts from different countries.

The 2015 conference will demonstrate continuity, tradition, and quality of 24 previously held conferences. It is an opportunity for participants to assess the development, applied automotive engineering expert scientific and engineering results with particular emphasis to improved safety.

This two day Conference will be held in English language consisting of the following special & technical sessions:

- Invited speakers session
- AutoSim 2015 – Special Session on Simulation in Automotive Engineering
- Safety (Vehicle & Traffic Safety, Vehicle Safety Performance, Road Accident Reconstruction and Analyses, Vehicle Safety Regulations)
- 5E - Engines, Emission, Ecology, Environment & Energy
- Advanced Engineering Technologies & Tools
- Automotive Logistics, including Vehicle Maintenance & After-Sales Support

Organization and Patronage Information

25th JUMV International Automotive Conference SCIENCE AND MOTOR VEHICLES 2015 is organized by the JUMV – The Society of Automotive Engineers in Serbia.

This event is organized under the Patronage of:

- FISITA* - International Federation of Automotive Engineers Societies
- EAEC - European Automotive Engineers Cooperation (to be confirmed)
- AINS - Academy of Engineering Sciences of Serbia
- EVU Serbia – Country Group Serbia of the European Association for Accident Reconstruction and Analyses.

Ministry of Education and Science of Serbia is expected to grant the financial support.

* FISITA is the international federation linking the national automotive engineering societies in 37 countries. FISITA was founded in 1948 as a neutral forum for the exchange of technical knowledge on every aspect of vehicle design, development and manufacture. FISITA is a non-profit organisation committed to helping create efficient, affordable, safe and sustainable automotive transportation. For further information on FISITA, including the full list of events organised or supported by the organisation please visit www.fisita.com.

International Programme Committee

Prof. Dr. Jovan Todorović, (ret.) University of Belgrade & JUMV, Serbia
 Prof. Dr.-Ing. habil. Egon-Christian von Glasner, EVU, Germany
 Prof. Dr.-Ing. Sigmar Micke, Germany
 Prof. Gabriele Virzi Mariotti, University of Palermo, Italy
 Prof. Gianfranco Rizzo, University of Palermo, Italy
 Prof. Dr. Ferdinand Trenc, University of Ljubljana, Slovenia
 Prof. Dr. Jan Lešinsky, Technical University of Bratislava, Slovakia
 Prof. Dr. Konstantinos Spentzas, (ret.) National TU of Athens, Greece
 Prof. Dr. Aleksandar Subić, RMIT University, Melbourne, Australia
 Prof. Dr. Dušan Gruden, Germany
 Dr. Stojan Čučuz, Halla Visteon Deutschland GmbH, Germany
 Dr. Branislav Basara, AVL List GmbH, Austria
 Dr. Marko Tirović, Cranfield University, UK
 Dr. Matyas Matolcsy, GTE, Hungary
 Mr. Alexander Berg, Dekra Automobile GmbH, Germany
 Prof. Dr. Slavko Muždeka, Military Academy, Belgrade, Serbia
 Mr. Aleksandar Grkić, Military Academy, Belgrade, Serbia
 Prof. Dr. Cedomir Duboka, JUMV, Belgrade, Serbia

Who should attend?

Automotive engineers and scientists, Road traffic safety engineers, Accident reconstruction experts, Managers from automotive and supply industry, Academia associates, Governmental officers, Students and young engineers in automotive engineering and other related engineering sciences are invited to present results of their research, development and engineering work, and to take part at the Conference.

This Conference provides unique opportunities for participants to establish new professional and personal contacts, to exchange with other participants the results of their engineering activities, experience and expertise, and to learn more about automotive and supply industry in Serbia in order to open new business opportunities for their companies. Serbia is nowadays a country of challenges and opportunities for all those willing to extend their business to this part of Europe.

This Conference is also an opportunity for foreign participants to learn more about Serbia, and to enjoy the traditional hospitality of this part of Europe.

Schedule of Sessions

Monday, 13 April 2015 - Registration of participants with Welcome Drink
 (place and time are to be announced)

International Conference – Tuesday, 14 April & Wednesday, 15 April 2015

The Conference will be held in the Crowne Plaza Hotel Belgrade
 The Preliminary Conference Schedule is as follows:

Date, Time & Place	Tuesday	Wednesday
	14 April 2015	15 April 2015
09h00	Automotive Logistics VIP / Guest Speaker Session	Automotive Safety 2015
13h30	Lunch	
14h30	AutoSim 2015	Advanced Engineering Techniques & Tools Engines, Emission, Ecology, Environment, Energy
20h30	Conference Dinner	

Language

English Language will be the official Conference language.

LIST OF SUBMITTED PAPERS as of December 1, 2014

VIP / Guest Speaker Presentations Session

Organized by **Prof. Dr. Cedomir Duboka, JUM V, and Prof. Dr.-Ing. Egon-Christian von Glasner, EVU & Daimler AG, rel. GER**

FISITA MESSAGE – To be announced

NMW15VIP-01

ARE THE BUSES SAFE OR NOT? ACCIDENT ANALYSIS BASED ON A LARGE DATASET
Matolcsy M., *GTE, HUN*

NMW15VIP-02

THE INFLUENCE OF THE EUTRE REGULATION FOR HEAVY TRUCKS AND BUSES ON ROAD SAFETY
Palkovits L., *Knorr-Bremse, Budapest, HUN*, Steffan H., *von Glasner E.-C., EVU, Graz, AUT*

NMW15VIP-03

THE 40 LOST YEARS ON THE ROUTE TO VISION ZERO AND HOW THEY CAN BE RECOVERED
Gullon AC., *ACEs, Ottawa, Ontario, CAN*

NMW15VIP-04

FUELING INFRASTRUCTURE DEVELOPMENT BASED ON VEHICLE FLEET DATA
Mihalic, M., *Ford Motor Company, Detroit, USA*

NMW15VIP-05

DISC BRAKE SQUEAL – CAUSES AND POSSIBLE SOLUTIONS
Vianello M., *Canfield University, GBR*, Bantiser P., *Jaguar Land Rover, Trovitó M., Canfield University, GBR*

NMW15VIP-06

Cutútz S., Hella Vision Deutschland GmbH, GER - To be announced

Autosim 2015 - SIMULATION IN AUTOMOTIVE TECHNOLOGY (Special Session)

Organized by **Doz. Dr. Branislav Basara, AVL List GmbH, Graz, Austria**

NMW15 Autosim-01

ON THE IMPORTANCE OF THE NEAR-WALL RANS MODEL IN HYBRID LES-RANS SIMULATIONS OF INTERNAL FLOWS
Hanjačić K., *Defini University of Technology, HOL / Novosibirsk State University, RUSS*

NMW15 Autosim-02

FLAME TRACKING – PARTICLE METHOD FOR 3D SIMULATION OF NORMAL AND ABNORMAL (KNOCKING) OPERATION OF SPARK-IGNITION AUTOMOTIVE ENGINES
Frolov S.M., *Ivanov V.S., Basesvich V.Ya., Beljaev A.A., N.N. Semenov Institute of Chemical Physics, Moscow, RUSS*, B. Basara, P. Priesching, M. Sufra, *AVL List GmbH, Graz, AUT*

NMW15 Autosim-03

ON MODELLING AND SIMULATIONS OF TRAFFIC INDUCED SMOG FORMATION IN COMPLEX URBAN AREAS
Kenjeres S., *TU Delft, HOL*

NMW15 Autosim-04

RECENT PROGRESS IN REDUCTION OF AERODYNAMIC DRAG OF GROUND VEHICLES
Kraljovic S., *Chalmers University of Technology, Goeteborg, SWE*

NMW15 Autosim-05

COMPUTATIONAL MODELLING OF PLASMA-ACTUATED TURBULENT FLOW CONTROL
Jakirlicic, S., *Maden, I., Maduta, R., Kriegseis, J., Grundmann, S. and Tropea, C., TU Darmstadt, GER*

NMW15 Autosim-06

EULERIAN MULTIPHASE MODELLING FOR AUTOMOTIVE APPLICATIONS
Greif D., *AVL List GmbH, Manbor, SLO*

NMW15 Autosim-07

RECENT EXTENSIONS AND VALIDATION OF THE PANS METHOD IN INDUSTRIALLY RELEVANT FLOWS
Basara, B., *AVL List GmbH, Graz, AUT*

NMW15-08 Autosim-08

SHAPE-PRESERVING LOOK-UP TABLE ADAPTATION IN EARLY-STAGES OF MODEL-BASED SYSTEM DEVELOPMENT PROCESS
Votul M., *OSE Engineering, FRA*

NMW15-12 Autosim - 09

METHOD FOR THE DESIGN OF AN OPTIMAL POWER TRAIN ON PREDEFINED LOAD SPECTRA (by the example of NEDC and WLTC)
Helberg T., *Meywerk M., Helmut Schmidt University, Hamburg, German*

AUTOMOTIVE SAFETY 2015

Chaired by **Dr. Marko Trovitó, Cranfield University, UK**

NMW15SAF-01

SAFETY & SUSTAINABILITY: TOWARDS A NEW CONCEPT OF CAR
Ciceri M.R., *Merati V., Ruscio D., Balestra M., Università Cattolica del Sacro Cuore, Unitá di ricerca in psicologia del traffico, Milan, ITA*

NMW15SAF-02

APPLICATION OF FUZZY AP METHOD FOR VEHICLE ROADWORTHNESS EVALUATION
Jatkimovska K., *Ss. Cyril and Methodius University of Skopje, Faculty of ME, MKD, Duboka C., Belgrade, SRB*

NMW15SAF-03

STATE-OF-THE-ART WAY OF WORKING IN ROAD SAFETY USING VIEWING ANALYSES
Pfeifer E., *ViewPointSystems, Vienna, AUT*

NMW15SAF-04

CGCLIST THROW DISTANCE IMPACT SPEED CONTOUR PLOTS USING PC-CRASH
Josevski N., *Sandvik, A., Gattney T., Josevski J., Winter B., Richardson, S., Delta-V-Experts, Moonee Ponds, VIC, AUS*

NMW15SAF-05

COMPARATIVE STATISTICS OF NEGATIVE PHENOMENONS IN ROAD TRAFFIC WITHIN NON-EUROPEAN AREA
Khanth N., *Vemola A., Semela, M., Brno University of Technology, CZE*

NMW15SAF-06

EVALUATION METHODS TO IMPROVE ROAD SAFETY OF HCT VEHICLE COMBINATIONS
Haataja M., *University of Oulu, Faculty of Technology, FIN*

NMW15SAF-07

PIV MEASUREMENTS OF AIR FLOW IN AND AT THE EXIT OF THE VENTED BRAKE DISC
Bombek G., *Hrbertnik A., University of Maribor, Faculty of Mechanical Engineering, SLO*

NMW15SAF-08

MODELING OF BRAKE BY WIRE SYSTEM
Adele-Ariz M.A., *El Batonomy Sh., Department of Automotive, Faculty of Engineering Ain Shams University, Cairo, EGY*

NMW15SAF-09

INNOVATIVE DESIGN OF A COMPOSITE SIDE DOOR: CRASHWORTHINESS EVALUATION AND DUMMY RESPONSE
Beinlgardi G., *Ji J., DIM/EAS, Politecnico Di Torino, Torino, ITA*

NMW15SAF-10

INFLUENCE OF FORMING PROCESSES ON CRASHWORTHINESS OF AUTOMOTIVE COMPONENTS
Castiglione G., *Beinlgardi G., DIM/EAS, Politecnico di Torino, Torino, ITA*

NMW15SAF-11

LIGHT-WEIGHT DESIGN APPLICATION: DESIGN OF A COMPOSITE VEHICLE ROOF AND ANALYSIS IN THE FRONTAL CRASH
Beinlgardi G., *Borzejanski S., DIM/EAS, Politecnico di Torino, ITA*

NMW15SAF-12

DESIGN OF A STABILITY CONTROLLER FOR HIGH SPEED TRACKED VEHICLES
Purdy D., *Simmer, D., Diskett, D., Duncan, A., WVS Group, Cranfield University, UK*

NMW15SAF-13

EXPERIMENTAL EVALUATION OF WHEEL FORCES APPLIED ON A HEAVY VEHICLE AND ESTIMATION OF MEASUREMENTS UNCERTAINTY
Koutlobochens D.V., *Papadannou G.D., School of Mechanical Engineering, National Technical University of Athens, GRE*

NMW15SAF-14

DYNAMIC ANALYSIS OF THE SUSPENSION SYSTEM OF A HEAVY VEHICLE THROUGH EXPERIMENTAL MEASUREMENTS
Koutlobochens D.V., *Papadannou G.D., School of Mechanical Engineering, National Technical University of Athens, GRE*

NMW15SAF-15

ANALYTICAL APPROACH TO YAW INSTABILITY, STEERING TREND AND OFF-TRACKING OF VEHICLE-TRAILER SYSTEMS CONNECTED BY ARTICULATED LINKAGES
Sorge F., *DiGiAlm, University of Palermo, ITA*

NMW15SAF-16

RACING CAR CHASSIS OPTIMISATION USING COMPUTER AIDED ENGINEERING
Campbell L., *Dodd T., Kajtez M., Rill/T, Melbourne, AU*

ADVANCED ENGINEERING TECHNIQUES & TOOLS

Chaired by Dr. Stojan Čučuz, Hella Visteon Deutschland GmbH, Keipen, GER

- NMV15/AET-01
CLUTCH DISC TORSIONAL CHARACTERISTICS OPTIMIZATION TO REDUCE IDLE AND GEAR RATTLE ON PASSENGER CAR
 Gili C., Anči M., Váleo Automotive, ACAR H., Bursa, TUR
- NMV15/AET-02
DYNAMIC PROPERTIES AS DESIGN CONSTRAINTS OF AUTOMOTIVE GEAR TRANSMISSION COMPONENTS
 Ognjanović M., Ristić M., University of Belgrade, Faculty of Mechanical Engineering, SRB
- NMV15/AET-03
AUTOMOTIVE TRANSIENTS: TAMING THE DEMON THROUGH SIMULATION AND OTHER MEANS
 Vaidya V., Tata Motors Ltd., Pune, IND
- NMV15/AET-04
PROJECT BOB - BICYCLE ON BUS
 Vučetić A., Božić M., Sagić G., Lulić Z., Faculty of Mechanical & Naval Engineering, University of Zagreb, CRO
- NMV15/AET-05
AUTOMATIC TRAVEL SPEED CONTROL FOR HAUL TRUCK AT OPEN PIT MINES
 Žikić M., Technical Faculty, Kukulj I., Copper mine, Tankić B., Stojadinović S., Technical faculty, Bor, SRB

AUTOMOTIVE LOGISTICS

Chaired by Prof. Dr. Jovan Todorović, University of Belgrade (ret.), SRB

- NMV15/AE-01
ENERGY-EFFICIENT DRIVING IN URBAN ENVIRONMENT BASED ON ADAPTIVE STOP&GO CRUISE CONTROL AND ITS IMPACT ON TRAFFIC FLOW AND EMISSION
 Kostić A., Klosova M., Kocarev Lj., Sr. Cyril and Methodius University in Skopje, MK
- NMV15/AE-02
THE ROLE AND IMPORTANCE OF TRAFFIC SAFETY AGENCY
 Miovanović M., Zastava Group, Kragujevac, SRB
- NMV15/AE-03
WINTER EQUIPMENT FOR VEHICLES AND WINTERDRIVING CONDITIONS- NORMATIVE REQUIREMENTS –MONTENEGRO CASE STUDY
 Cabaraka M., Faculty for Transport, Communications and Logistics, Berane, MNE
- NMV15/AE-04
QUALITATIVE SERVICE: A WAY TO RELIABLE AND SAFE MOTOR TRANSPORT
 Makarova I., Khabibullin R., Mukhamedimov E., Belayev E., Kazan Federal University, Neberezhnye Chelny, RUS
- NMV15/AE-05
FULLY ELECTRIC BUS - A NEW CONCEPT OF CLEAN AND ENERGY EFFICIENT CITY BUS
 Mišanović S., GSP – City Transport Company, Zivanović Z., Vintča Institute, Belgrade, SRB
- NMV15/AE-06
METHODOLOGY OF MAINTENANCE MANAGEMENT FOR ENERGY EFFICIENT AND RATIONAL VEHICLE FLEET OPERATION
 Vujanović D., Bojović N., Bundić S., University of Belgrade, Faculty of Transport & Traffic Engineering, Belgrade, SRB
- NMV15/AE-07
THE INFLUENCE OF FLEET „RENEWAL “ ON TRAFFIC SAFETY IN GSP „BEOGRAD“
 Vukšić V., City Transport Company GSP, Belgrade, SRB
- NMV15/AE-08
ECO-DRIVING TRAINING POTENTIAL IN REAL-WORLD OPERATION OF A HGV FLEET IN SERBIA
 Mončillović V., Cvetković M., University of Belgrade – Faculty of Transport & Traffic Engng, SRB
- NMV15/AE-09
ENGINE PARAMETER MONITORING IN ADDITION TO ENHANCED MAINTENANCE
 Kukulj I., Copper mines Bor, Žikić M., Stojadinović S., University of Belgrade, Technical Faculty in Bor, SRB
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5E - Engines, Emissions, Ecology, Environment, Energy

Chaired by Prof. Dr. Ferdinand Trenc, University of Ljubljana, SLO

- NMV15/5E01
REDUCTION OF CARBON DIOXIDE EMISSIONS FROM AUTOMOBILE ENGINE USING ETHANOL AS FUEL
 de Almeida L. G., Monteiro Sales L. C., Sodré JR., Pontifical Catholic University of Minas Gerais, BRA
- NMV15/5E02
RESEARCH TESTBED FOR HCCI ENGINE
 Božić M., Vučetić A., Ilincić P., Kozarac D., Lulić Z., Faculty of Mech. & Naval Engineering, University of Zagreb, CRO
- NMV15/5E03
IMITATOR OF ADJACENT ENERGY SPECTRUM FOR COMPLEX HEAT EXCHANGE IN THE DIESEL COMBUSTION CHAMBER
 Merzlikhin V., MAMM, Moscow, RUS
- NMV15/5E04
IMPACT OF ROD RATIO ON WEAR DIAGRAM OF IC ENGINE CRANKSHAFT JOURNAL BEARING
 Đorić J., Mišić M., Faculty of Technical Sciences, University of Novi Sad, SRB
- NMV15/5E05 (to be confirmed)
IDENTIFICATION OF SOURCES FOR DIESEL ENGINE'S ACOUSTIC EMISSIONS
 Narayan S., Universta di Roma Tre, ITA

Important Dates

- 15 February 2015 – Submission of final manuscripts
- 01 March 2015 – Registration Fee payment for Authors (Dead line)
- 15 March 2015 – Final Programme Issuing
- 01 April 2015 – Registration Fee payment for other participants
- 13 April 2015 @ 18h00 – Registration of participants and Welcome Drink
- 14 April 2015 @ 09h00 – Opening of the Conference

Visa & Letters of Invitation

Majority of participants will be allowed to enter Republic of Serbia without visa. However, in order to avoid any misunderstandings, participants are kindly requested to visit <http://www.mta.gov.rs/ConsularAffairs.htm>, for an updated information concerning the visa regime for those wishing to enter Serbia or to contact the nearest Consular Offices or Diplomatic Missions of the Republic of Serbia in their country. Upon request, JUMV will provide personal invitation letter to any participants after the registration fee was paid.

Registration

Registration Fee includes Conference CD Proceedings, admission to all Sessions, Conference Dinner, Welcome Drink, Refreshment at Coffee Breaks and catered Lunches.
 Standard Registration fee will be € 425.00 (VAT included, Bank handling cost not included).
 Early registration discount will apply for registration fee payment before 15th February 2015.
 Special discount will be granted to all former participants of the Conference. Upon request, special registration fee rates will be offered to students, young engineers, JUMV partners, etc.
 Walk-in to the conference will not be accepted.
 To register, please download and fill-in the registration form from www.nmv2015.jumv.rs or fill-in the enclosed Registration Form and mail/fax it to JUMV.

Money Transfer details will be available upon request.
 Please mail the copy of payment document (SWIFT) to cdubock@eunet.rs; cdubock@jumv.rs
 Payment by Cheque to JUMV or Western Union Money Transfer will also be accepted.

Advertising, Promotional & Sponsorship Opportunities

All authors, the companies from where they come and other companies are invited to benefit the Advertising, Promotional & Sponsorship Opportunities of this Conference, which are tailored to fit their individual needs.

For more information please visit www.nmv2015.jumv.rs or contact the JUMV by Phone, E-mail or Fax.

Accommodation

Accommodation should be managed on the participants' own.
 Crowne Plaza Belgrade Hotel, 11070 Belgrade, V. Popovicka 10, Phone +38111/2204-121, Email nada.diklic@hpa.com, www.hpa.com/crowneplaza offers special discount to the conference participants. While booking, please make reference to JUMV2015. Otherwise, please use any standard booking possibilities like booking.com, hotels.com or expedia.com.

Conference Contact Information

JUMV (Prof. Dr. Č. Dubocka), c/o Faculty of Mechanical Engineering * SRB-11200 Belgrade 35, POB 34, Kraljice Marije 16, Serbia
 Phone: (+381-11) 3340-762, 4058-229, 3370-358, 3302-288, * Fax: (+381-11) 4058-229, 3370-364
 E-mail: cdubocka@eunet.rs; cdubocka@jumv.rs; cdubocka@gmail.com; cdubocka@mas.bg.ac.rs; * <http://www.nmv2015.jumv.rs>

JUMV Case Study: The history of the Science & Motor Vehicles Conference



FISITA recently granted patronage to the JUMV 2015 International Automotive Conference that was established in 1967 as a professional seminar organised at the Faculty of Mechanical Engineering in Belgrade, capital of the former Yugoslavia.

Founded by Dr. Jovan Todorović, Professor of Automotive Engineering and a former FISITA Vice President, the conference was initially organised in association with the R&D departments of main automotive component and vehicle manufacturers.

JUMV (the Yugoslav Society of Automotive Engineers) was later founded in October 1972 and soon became a FISITA Member Society, taking over organisation of the conference.

Beginning as a national conference with international participants, the conference quickly grew to become a truly international event, receiving significant contributions from the likes of Dr. Thomas Peter Newcomb, Guy Tidbury, Prof. Pal Michelberger, Prof. H. P. Lenz and many others.

This worldwide recognition coincided with the internal transformation of former Yugoslavia, and in 1986, Belgrade was the host city for the 21st FISITA World Automotive Congress, welcoming over 1,200

participants, the largest number of FISITA Congress attendees up to that time.

Despite great domestic challenges including political, economic and social crises leading to war, dissimulation and continued change in national name, size, and structure, the JUMV Conference has managed to survive. In April 2015, it will celebrate its 25th event.

Serbia is now a European Union candidate country and offers international investors great opportunities, particularly in the automotive engineering industry. Belgrade has become known both at home and abroad as the "capital of good life and spirit" offering all those who visit it a welcoming atmosphere and an ethos that looks towards the future.

The 25th Science and Motor Vehicles International Automotive Conference will take place from 14–15 April 2015 in Beograd, Belgrade.

More information
www.nmv2015.jumv.rs

For more information on how JUMV developed, improved and sustained the Science and Motor Vehicles Conference, please contact:
Prof. Dr. Čedomir Duboka, JUMV President
Cduboka@eunet.rs