

Program overview

Tuesday, 10 September 2019	16:30-16:50	Hall 1	Conference Opening Ceremony	
	16:50-17:50	Hall 1	Plenary Session	
	19:30-22:00	Welcome Cocktail Party – Hotel “Arena” Sozopol		
Wednesday, 11 September 2019		Hall 1	Hall 2	Hall 3
	9:00-11:00	Session: Aeronautics	Session: Transport Management and Logistics	Session: Dynamics, Strength and Reliability of Vehicles
	11:00-11:30	Coffee Break		
	11:30-13:30	Session: Aeronautics	Session: Transport Management and Logistics	
	13:00-14:00	Lunch Break		
	14:00-16:00	Session: Internal Combustion Engines	Session: Railway Engineering and Technologies	
	16:00-16:30	Coffee Break		
	16:30-18:30	Session: Automotive Engineering		
	19:30-23:00	Official Banquet – Hotel “Selena” Sozopol		
Thursday, 12 September 2019	10:00-10:30	Conference Closing Ceremony		

Technical Program

Tuesday, 10 September 2019

Hall 1

16:30 Conference Opening Ceremony

Plenary Session

16:50 Integration of the environomic energy services for mobility and household using electric vehicle with a range extender of solid oxide fuel cell

Z Dimitrova

PSA Groupe, Centre Technique de Vélizy, France

17:10 Shell Eco Marathon – presentation of the Technical University – Sofia team

C. Gechev

Department of Combustion Engines, Automobile Engineering and Transport, Technical University – Sofia, Bulgaria

17:30 Other presentations

19:30 Welcome Cocktail Party – Hotel “Arena” Sozopol

Section: **Aeronautics**
Wednesday, 11 September 2019
Hall 1

Chairman: Prof. F. Massouh, PhD
Arts et Métiers - ParisTech, DynFluid laboratory, ENSAM university, France

09:00 **Transonic flow hysteresis in divergent bent channels**

A Kuzmin
St Petersburg State University, Russia

09:20 **Calculation of the maximum endurance of a small unmanned aerial vehicle in a hover**

J Hnidka and D Rozehnal
University of Defence in Brno, Czech Republic

09:40 **Numerical study of a shock-wave boundary-layer interaction: compression ramp flow-fields**

O Elsayed
International University of Rabat, Morocco

10:00 **Prediction of the impact of friction's coefficient in cylindrical deep drawing for AA2090 Al-Li alloy using FEM and Taguchi approach**

K Bouchaâla^{1,2}, M Ghanameh^{1,3}, M Faqir¹, M Mada² and E Essadiqi¹
¹International University of Rabat, Morocco, ²Mohammed V University, Morocco, ³Damascus University, Syria

10:20 **Effect of a vortex trapping cavity (VTC) on aerodynamic properties of a thick wind turbine airfoil**

K Qaissi, O Elsayed, M Faqir, E Essadiqi and M Ghanameh
International University of Rabat, Morocco

10:40 **Initial analysis of an aircraft accident**

K Mañas, J Hnidka and V Tríska
University of Defence in Brno, Czech Republic

Coffee Break

Section: **Aeronautics**
Wednesday, 11 September 2019
Hall 1

Chairman: Prof. A. Kuzmin, DSc
Department of Fluid Dynamics, St. Petersburg State University, St. Petersburg, Russia

11:30 **Effective use of a helicopter with a Bambi bucket firefighting system in Bulgaria**
 D Seyzinski, I Georgiev, H Panayotov and S Penchev
Technical University – Sofia, Plovdiv Branch, Bulgaria

11:45 **Assessment of the fuel efficiency of unmanned cargo aircraft, based on general aviation aircraft**
 V Serbezov
Technical University – Sofia, Bulgaria

12:00 **Noise sensitivity of a bio-inspired echolocation model**
 K Georgiev and R Nikolova
Technical University – Sofia, Bulgaria

12:15 **Numerical study on the optimal airfoil shape for supersonic flight in the jovian atmosphere**
 F Panayotov¹, N Veselinov², V Shishkin², D Mladenov², R Nikolova¹, I Dobrev³, F Massouh³, M Todorov¹
¹Technical University – Sofia, Bulgaria, ²Sofia University St. Kliment Ohridski, Bulgaria, ³Arts et Métiers ParisTech, France

12:30 **Numerical study on the influence of the geometric characteristics of the blades on the rotor aerodynamic efficiency of horizontal axis wind turbines**
 F Panayotov¹, R Ghinous², O Rahhali² and M Todorov¹
¹Technical University – Sofia, Bulgaria, ²International University of Rabat, Morocco

12:45 **Using drones in fire-fighting missions**
 V Radkov¹, V Aleksandrova² and A Guncheva²
¹Technical University – Sofia, Bulgaria, ²National Defence College G. S. Rakovski, Bulgaria

13:00 **A review of errors and violations in maintenance performance in four aircraft maintenance organisations**
 J Litsov and K Georgiev
Technical University – Sofia, Bulgaria

Lunch Break

Section: **Internal Combustion Engines**

Wednesday, 11 September 2019

Hall 1

Chairman: Assoc. Prof. Pl. Punov, PhD,
Department of Combustion Engines, Automobile Engineering and Transport, Technical University – Sofia, Bulgaria

14:00 **Adjustment parameters of internal combustion engine working with methane**

R Dimitrov¹, K Bogdanov¹, R Wrobel², L Serrano³, V Mihaylov¹

¹*Technical University of Varna, Bulgaria*, ²*Wroclaw University of Science and technology, Poland*, ³*Polytechnic of Leiria, Portugal*

14:15 **Flow characteristics of gas injectors**

Z Ivanov¹, S Stoyanov¹, V Mihaylov¹ and H Santos²

¹*Technical University of Varna, Bulgaria*, ²*Polytechnic of Leiria, Portugal*

14:30 **Economic aspects of using hydrogen in compression ignition engine operating on gas-diesel cycle**

E Dimitrov, S Pantchev, Ph Michaylov and M Peychev

Technical University – Sofia, Bulgaria

14:45 **Vibroacoustic analysis of marine engine supplied with mixture of fuels**

R Wróbel¹, M Andrych¹, M Tkaczyk¹, S Fryda¹ and R Dimitrov²

¹*Wroclaw University of Science and Technology, Poland*, ²*Technical University – Varna, Bulgaria*

15:00 **Water-hydrocarbons mixture as a fuel for diesel engine**

P Haller¹, Z Ivananov², L Sitnik¹ and M Skrzętownicz¹

¹*Wroclaw University of Science and Technology, Poland*, ²*Technical University – Varna, Bulgaria*

15:15 **Bio Mix Diesel (BMD) as a fuel for Diesel engines**

L Sitnik¹, M Skrzętownicz¹, I Zdravkov² and V Mihaylov²

Wroclaw University of Science and Technology, Poland, ²*Technical University – Varna, Bulgaria*

15:30 **Advanced solutions providing for safety of shipping in coastal areas**

G Dimitrov

Nikola Vaptsarov Naval Academy, Varna, Bulgaria

Coffee Break

Section: Automotive Engineering**Wednesday, 11 September 2019****Hall 1**

Chairman: Assoc. Prof. St. Dimitrov, PhD,
Department of Combustion Engines, Automobile Engineering and Transport, Technical University – Sofia, Bulgaria

16:30 **Performance and economic analysis of an organic Rankine Cycle for hybrid electric vehicles**

Z Dimitrova

PSA Groupe, Centre Technique de Vélizy, France

16:50 **Accumulation of metabolic carbon dioxide (CO₂) in a vehicle cabin**

R Angelova, D Markov, I Simova, R Velichkova, P Stankov

Technical University – Sofia, Bulgaria

17:10 **Optimal three-loop cascade PI-P-PI controller for electro-hydraulic power steering system**

J Kralev, A Mitov, T Slavov and I Angelov

Technical University – Sofia, Bulgaria

17:30 **Study of the stresses in front suspension components of a car when passing through speed breakers**

Z Georgiev and L Kunchev

Technical University – Sofia, Bulgaria

17:50 **Kinematic analysis of the Multilink front suspension of a motorcycle**

S Hesapchieva, G Yanachkov and D Hlebarski

Technical University – Sofia, Bulgaria

18:10 **Life cycle assessment of vehicles, using LPG and NG**

I Evtimov, R Ivanov and H Stanchev

“Angel Kanchev” University of Ruse, Bulgaria

18:30 **Graph-analytical method for analysis of vehicle-pedestrian forward projection impact accidents with forward and transverse post-impact motion of pedestrian body on uneven road with gradient**

D Hlebarski

Technical University – Sofia, Bulgaria

Official Banquet – Hotel “Selena” Sozopol

Section: **Transport Management and Logistics**

Wednesday, 11 September 2019

Hall 2

Chairman: Assoc. Prof. S. Stoilova, DSc
Department of Railway Engineering, Technical University – Sofia, Bulgaria

09:00 **Reliability and availability assessment of a transport system using Dynamic Fault Tree and Monte Carlo simulation**

M Szkoda, G Kaczor and M Satora
Cracow University of Technology, Poland

09:20 **Development of a repair technology for locomotive units on the basis of the theory of decision**

V Puzyr, Y Datsun, O Obozny and V Pyvo
Ukrainian State University of Railway Transport, Ukraine

09:40 **Traffic potential determining as an important part of the sustainable railway passenger transport**

M Dedík, M Kendra, T Čechovič and M Vojtek
University of Žilina, Slovakia

10:00 **Modelling the passenger service rate of one transport hub for urban route as a queueing system**

A Asenov, V Pencheva and I Georgiev
“Angel Kanchev” University of Ruse, Bulgaria

10:20 **Analysis of the load on the taxi system in a medium-sized city**

D Grozev, M Milchev and I Georgiev
“Angel Kanchev” University of Ruse, Bulgaria

10:40 **Determination of railway infrastructure capacity in context of automatization of selected transport processes**

M Dluhoš, L Čechovič¹ and J Gašparík
University of Zilina, Slovakia

Coffee Break

Section: Transport Management and Logistics**Wednesday, 11 September 2019****Hall 2****Chairman:** Assoc. Prof. A. Asenov, PhD*Department Transport, "Angel Kanchev" University of Ruse, Bulgaria***11:30 A multi-criteria selection of the transport plan of intercity passenger trains**

S Stoilova

*Technical University – Sofia, Bulgaria***11:50 Choosing the container handling equipment in a rail-road intermodal terminal through multi-criteria methods**

S Stoilova and S Martinov

*Technical University – Sofia, Bulgaria***12:10 Strategic planning and development of transport infrastructures based on agile methodology**

D Dimitrov and I Petrova

*Todor Kableshkov University of Transport, Sofia, Bulgaria***12:30 Network model of passenger railway rolling stock scheduling**

M Todorova

*Todor Kableshkov University of Transport, Sofia, Bulgaria***12:50 A survey on needs and possibilities of training in acquiring "Train dispatcher" qualification**

M Todorova, T Kirchev and K Trifonov

*Todor Kableshkov University of Transport, Sofia, Bulgaria***13:10 Trends for application of mobile robots for logistics (transport) activities based on Industry 4.0**

D Ginchev and M Mimilev

*Technical University – Sofia, Bulgaria***13:30 Formalization of quality improving task for goods of customs control**

U T Jonibek and K Jiyanbekov

*Tashkent University of Information Technologies, Uzbekistan****Lunch Break***

Section: **Railway Engineering and Technologies**

Wednesday, 11 September 2019

Hall 2

Chairman: Assoc. Prof. K. Velkov, PhD

Department of Railway engineering, Technical University – Sofia, Bulgaria

- 14:00 **Research of the influence of geometric unevenness of the railway track on the dynamic parameters of the railway rolling stock with two-stage spring suspension**
 A Kuzyshyn¹, S Kostritsa¹, L Ursulyak¹, A Batig², J Sobolevska², O Voznyak³
¹Dniprovsk National University of Railway Transport, Ukraine, ²Lviv Research Institute of Forensic Expertise, Ukraine, ³Lviv branch of Dniprovsk National University of Railway Transport, Ukraine
- 14:20 **Study of the prospect of k-Li lubricant for axle boxes of the railway rolling stock**
 A Kravets, A Yevtushenko, L Kozar, A Kravets, M Kovalov
Ukrainian State University of Railway Transport, Ukraine
- 14:40 **Comparative analysis of the results of theoretical and experimental studies of freight wagon Sdggmrss-twin**
 V Stoilov¹, G Simić², S Purgić¹, D Milković², S Slavchev¹, S Radulović², V Maznichki¹
¹Technical University – Sofia, Bulgaria, ²University of Belgrade, Serbia
- 15:00 **Analysis of some issues in the theoretical studies of unloading flaps strength of wagon series Falns**
 S Slavchev, V Stoilov, V Maznichki, and S Purgic
Technical University – Sofia, Bulgaria
- 15:20 **Preservation of macro fractographic signs of the plane of fracture of the details for expert engineering research**
 A Batig¹, P Hrytsyshyn^{1,2,3}, O Kovalchuck¹, A Kuzyshyn^{1,4}, S Dovhaniuk⁴ and J Sobolevska³,
¹Lviv Research Institute of Forensic Expertise, Ukraine, ²Western centre of the Ukrainian branch of the World laboratory, Ukraine, ³Lviv branch of Dniprovsk National University of Railway Transport, Ukraine, ⁴Dniprovsk National University of Railway Transport, Ukraine
- 15:40 **Problems of interaction of contact wire and current collectors of electric transport with different contact materials**
 M Babyak, *Lviv branch of Dnipro National University of Railway Transport, Ukraine*
- 16:00 **Damage analysis of locomotive diesel engine type 5D49 cylinder heads**
 O Krastev and K Velkov, *Technical University – Sofia*
- 16:20 **Vibroacoustics analysis of the railway rolling stock unit**
 Y Zelenko and D Yanchenko, *Dniprovsk National University of Railway Transport, Ukraine*

Coffee Break

Section: **Dynamics, Strength and Reliability of Vehicles**
Wednesday, 11 September 2019
Hall 3

Chairman: Prof. I. Kralov, DSc

“Mechanics” Department, Technical University – Sofia, Bulgaria

09:00 **Neural model of projecting flexural strength of cement concrete intended for airfield pavements**

M Linek, Kielce University of Technology, Poland

09:20 **Rationalization of cross-sections of the composite reinforced concrete span structure of bridges with a monolithic reinforced concrete roadway slab**

G Vatulia, O Lobiak, S Deryzemlia, M Verevicheva, Y Orel

Ukrainian State University of Railway Transport, Ukraine

09:40 **Web-based virtual reality for simulation of a heavy manipulator with a freely suspended payload**

R Mitrev, B Tudjarov and T Todorov, Technical University – Sofia, Bulgaria

10:00 **Machine for accelerated cyclic corrosion tests through alternate immersion in salt solution**

N Nikolov, V Tsonev, K Penkov, N Kuzmanov and B Borisov

Technical University – Sofia, Bulgaria

10:20 **Hydroacoustic stand for evaluating underwater sound systems in a measurement pool**

I Iliev and N Kolev, Nikola Vaptsarov Naval Academy, Varna, Bulgaria

10:40 **Modelling of a semi-active vehicle suspension implemented with magneto-rheological dampers**

J Genov, Technical University – Sofia, Bulgaria

11:00 **Multicriterial synthesis of the control law for a semi-active spatial model of the vehicle suspension**

J Genov, Technical University – Sofia, Bulgaria

11:20 **Approach for reverse engineering of complex geometry components**

Y Sofronov, M Zagorski, G Todorov and T Gavrilov, Technical University – Sofia, Bulgaria

Coffee Break