



**Innovation Center of
Faculty of Mechanical
Engineering**



**Faculty of Mechanical
Engineering, University
of Belgrade**



**Center for Business
Trainings**



„International Conference of Experimental and Numerical Investigations and New Technologies“

Sponsored by:

**MINISTRY OF EDUCATION, SCIENCE AND TECHNICAL DEVELOPMENT
OF THE REPUBLIC OF SERBIA**

Programme and The Book of Abstracts

29 June – 02 July 2021

Zlatibor, Serbia

**„International Conference of Experimental and Numerical
Investigations and New Technologies“**

CNN TECH 2021

29 June – 02 July 2021

Hotel Mona, Miladina Pecinara 26, Zlatibor, Serbia

<http://cnntechno.com>

Programme and The Book of Abstracts

Organised by:

Innovation Center of Faculty of Mechanical Engineering

Faculty of Mechanical Engineering, University of Belgrade

Center for Business Trainings

Sponsored by:

Ministry of Education, Science and Technical development of the
Republic of Serbia

Title:	International Conference of Experimental and Numerical Investigations and New Technologies – CNN TECH 2021 PROGRAMME AND THE BOOK OF ABSTRACTS
Publisher:	Innovation Center of Faculty of Mechanical Engineering Kraljice Marije 16, 11120 Belgrade 35 tel: (+381 11) 3302-346, fax 3370364 e-mail: cnntechno@gmail.com web site: http://cnntechno.com , http://www.inovacionicentar.rs
Editors:	Dr Goran Mladenovic, Associate Professor Dr Martina Balac, Senior Scientific Researcher Dr Aleksandra Dragicevic, Scientific Researcher
Technical editor	Dr Goran Mladenovic, Associate Professor
Cover page:	Dr Goran Mladenovic, Associate Professor
Printed in:	Innovation Center of Faculty of Mechanical Engineering Kraljice Marije 16 11120 Belgrade 35 tel: (+381 11) 3302-346
Circulation:	100 copies. The end of printing: June 2021.

ISBN: 978-86-6060-077-8

Copyright© 2021 International Conference of Experimental and Numerical Investigations and New Technologies – **CNN TECH 2021**

“International Conference of Experimental and Numerical Investigations and New Technologies”

CNN TECH 2021

SCIENTIFIC COMMITTEE:

Milos Milosevic, Serbia (chairman)	Tozan Hakan, Turkey
Nenad Mitrovic, Serbia (co-chairman)	Nikola Momcilovic, Serbia
Aleksandar Sedmak, Serbia	Traussnigg Udo, Austria
Hloch Sergej, Slovakia	Gordana Bakic, Serbia
Drazan Kozak, Croatia	Katarina Colic, Serbia
Nenad Gubelj, Slovenia	Peter Horňak, Slovakia
Monka Peter, Slovakia	Róbert Huňady, Slovakia
Snezana Kirin, Serbia	Martin Hagara, Slovakia
Samardzic Ivan, Croatia	Jovan Tanaskovic, Serbia
Martina Balac, Serbia	Aleksa Milovanovic, Serbia
Mládková Ludmila, Czech Republic	Marija Durkovic, Serbia
Johanyák Zsolt Csaba, Hungary	Tsanka Dikova, Bulgaria
Igor Svetel, Serbia	Ján Danko, Slovakia
Aleksandra Mitrovic, Serbia	Ognjen Pekovic, Serbia
Valentin Birdeanu, Romania	Jelena Svorcan, Serbia
Danilo Nikolic, Montenegro	Suzana Filipovic, Serbia
Goran Mladenovic, Serbia	Darko Kosanovic, Serbia
Bajic Darko, Montenegro	Nebojsa Manic, Serbia
Tasko Manski, Srbija	Zorana Golubovic, Serbia
Luis Reis, Portugal	Vera Pavlovic, Serbia
Zarko Miskovic, Serbia	

ORGANIZING COMMITTEE:

Nenad Mitrovic (chairman)	Dragana Perovic
Milos Milosevic (co-chairman)	Aleksandra Joksimovic
Aleksandar Sedmak	Beti Kostadinovska Dimitrovska
Martina Balac	Tsanka Dikova
Vesna Miletic	Isaak Trajkovic
Igor Svetel	Toni Ivanov
Goran Mladenovic	Snezana Kirin
Aleksandra Mitrovic	Igor Stankovic
Aleksandra Dragicevic	Ivana Vasovic Maksimovic
Zarko Miskovic	Nina Obradovic
Katarina Colic	Andreja Stojic
Milan Travica	Ivana Jevtic



ACKNOWLEDGEMENT

The organizing committee of the 5th International Conference of Experimental and Numerical Investigations and New Technologies – CNN TECH 2021 wishes to sincerely thank all the institutions and individuals who by means of personal engagement and constructive action helped organizing this conference.

We particularly wish to thank our sponsor, **The Ministry of Education, Science and Technological development**, Government of the Republic of Serbia.

We are also grateful to companies, **3D Republic, Shimatzu, Trokutttest, IMW Institute** and **Inter Cert** who have significantly contributed to the organization and realization of the conference.

PREFACE

Dear Friends and Colleagues, Welcome to CNN Tech 2021 Conference and the fabulous mountain of Zlatibor!

With 90 papers (17 by international authors) and contributions by authors from 12 different countries, International Conference of Experimental and Numerical Investigations and New Technologies CNN Tech 2021 successfully sets the high level for the future conferences. Participation of a large number of domestic and international authors, as well as the diversity of topics, justifies our efforts to organize this conference and contribute to exchange of knowledge, research results and experience of industry experts, research institutions and faculties which all share a common interest in the field in experimental and numerical investigations.

This year CNN Tech 2021 focuses on the following topics:

- Mechanical Engineering,
- Engineering Materials,
- Chemical and Process Engineering,
- Experimental Techniques,
- Numerical Methods,
- New Technologies,
- Clear sky,
- Sustainable Design and New Technologies,
- Advanced Materials and Technology,
- Artificial intelligence and
- Student session.

Apart from a plenty of interesting lectures, the participants will have a chance to lighten up and communicate in friendly and relaxed settings.

Organizing committee of CNN Tech 2021 would like to express gratitude to Ministry of Education, Science and Technological development for financial support of the Conference.

On behalf of the Innovation center of Faculty of Mechanical Engineering, Faculty of Mechanical Engineering and Center for Business Trainings, we wish this to be splendid CNN Tech conference filled with many memorable moments.

PROGRAMME AND ORGANIZING COMMITTEE

CONTENTS

PROGRAMME	i
ABSTRACTS	1
Mechanical Engineering	2
<i>Emil Veg</i> VIBRATION MONITORING, ANALYSIS AND DAMPING AT THE HYDRO POWER PLANT	3
<i>Zarko Miskovic, Radivoje Mitrovic, Milos Milosevic, Goran Petrovic, Goran Mladenovic, Isaak Trajkovic, Dejan Markovic</i> DESIGN AND RAPID PROTOTYPING OF MEDICAL DEVICES – CASE STUDY: MECHANICAL VENTILATOR.....	4
<i>Marko Ristic, Ljiljana Radovanovic, Jasmina Perisic, Ivana Vasovic, Goran Otic</i> AFFECT ON FORECASTING RELIABILITY SAFETY ENGINE IN MEDICAL INSTITUTIONS..	5
<i>Ivan M. Buzurovic, Dragutin Lj. Debeljkovic, Aleksandra M. Jovanovic</i> A NATURAL REGULARIZATION OF LINEAR DISCRETE DESCRIPTOR TIME DELAY SYSTEMS.....	6
<i>Ivan M. Buzurovic, Dragutin Lj. Debeljkovic, Aleksandra M. Jovanovic</i> A NATURAL REGULARIZATION OF LINEAR CONTINUOUS SINGULAR TIME DELAY SYSTEMS.....	7
<i>Bojan Cudic, Matjaz Klemencic, Milos Milosevic</i> START-UP COMMUNITY AND THE ACCELERATION SERVICES IN THE DANUBE MACRO-REGION: CASES OF AUSTRIA, BOSNIA AND HERZEGOVINA, HUNGARY AND SLOVENIA.....	8
<i>Jelena Sakovic Jovanovic, Aleksandar Vujovic</i> PERFORMANCE MANAGEMENT AND LEAN MANUFACTURING IN ORDER TO ENSURE SUSTAINABLE DEVELOPMENT OF THE ORGANIZATION	9
<i>Milos D. Pjevic, Mihajlo D. Popovic, Goran M. Mladenovic, Ljubodrag M. Tanovic, Radovan M. Puzovic</i> APPLICABILITY OF RAPID TOOLING IN INJECTION MOLDING APPLICATION.....	10
<i>Ana Radulovic</i> TRENDS IN THE DEVELOPMENT OF LOGISTICS	11
<i>Goran Vasilic, Sasa Zivanovic, Branko Kokotovic, Zoran Dimic, Milan Milutinovic</i> CONFIGURING A CLASS OF MACHINES BASED ON RECONFIGURABLE 2DOF PLANAR PARALLEL MECHANISM.....	12

Engineering Materials.....	13
<i>Miljana Mirkovic, Suzana Filipovic, Pavle Maskovic, Vladimir Pavlovic</i>	
PHASE MORPHOLOGICAL AND ANTIMICROBIAL PROPERTIES OF HAP-TIO2 NANOMATERIALS OBTAINED BY DIFFERENT SYNTHESIS ROUTE.....	14
<i>Ivana Jevtic, Aleksa Milovanovic, Isaak Trajkovic, Milan Travica, Aleksandar Sedmak, Aleksandar Grbovic, Filippo Berto</i>	
INFLUENCE OF PRINTING PARAMETERS ON DIMENSIONAL STABILITY OF SENB SPECIMENS MADE FROM PLA AND PLA-X MATERIALS.....	15
<i>Aleksandra Jelic, Milan Travica, Vukasin Ugrinovic, Aleksandra Bozic, Marina Stamenovic, Dominik Brkic, Slavisa Putic</i>	
INVESTIGATION OF TENSILE PROPERTIES OF CARBON/EPOXY SANDWICH PANELS WITH DIFFERENT FIBER ORIENTATION USING DIGITAL IMAGE CORRELATION.....	16
<i>Milos Milosevic, Ivana Jevtic, Isaak Trajkovic, Zarko Miskovic, Tihomir Cuzovic, Aleksa Milovanovic, Milan Travica</i>	
SURFACE PROPERTIES ANALYSIS OF METALLIC ADDITIVE MANUFACTURING MATERIALS	17
<i>Isaak Trajkovic, Aleksa Milovanovic, Ivana Jevtic, Milan Travica, Liviu Marsavina, Bojan Medjo, Lubos Nahlik</i>	
MONITORING OF FRACTURE MECHANICS PARAMETERS ON SINGLE EDGE NOTCHED TENSION SPECIMENS MADE OF PLA MATERIAL.....	18
<i>Vladimir Pejakovic</i>	
TRIBOLOGICAL BEHAVIOR OF SULFATE BASED IONIC LIQUIDS AS LUBRICANT ADDITIVES – REVIEW	19
<i>Emina Dzindo</i>	
CRACKS IN WELDED JOINTS	20
<i>Joksimovic Aleksandra, Dusko Radakovic</i>	
APPLICATION OF GENERATIVE DESIGN ON THE BRACKET MODEL	21
Chemical and Process Engineering	22
<i>Jelena Vujancevic, Jovana Cirkovic, Endre Horváth, László Forró, Vladimir Pavlovic, Dorde Janackovic</i>	
INFLUENCE OF ANODIZATION VOLTAGE ON PHOTOCATALYTIC ACTIVITY OF TIO2 NANOTUBES	23
<i>Nada V. Ratkovic Kovacevic, Djordje N. Dihovicni, Slavica B. Cabrilo, Visnja M. Sikimic, Aleksandra D. Mitrovic</i>	
THE SMART PACKAGING AND APPLICATIONS IN INDUSTRIAL FOOD PROCESSING ...	24

<i>Dragoljub R. Bovan, Zoran B. Ciric, Nada V. Ratkovic Kovacevic, Djordje N. Dihovicni, Dragan D. Kreculj</i> AUTOMATION OF THE BAG FILTER CLEANING IN INDUSTRIAL AIR PURIFICATION SYSTEM	25
<i>Aleksandra Mitrovic, Andrej Goranovic, Zorana Golubovic,</i> SOLDERING TECHNOLOGY OF INSTALLATION PIPES IN THE MANUFACTURING PROCESS OF VRV SYSTEMS	26
Experimental Techniques	27
<i>Katarina Maksimovic</i> DAMAGE TOLERANCE ANALYSIS OF AIRCRAFT STRUCTURAL ELEMENTS	28
<i>Katarina Maksimovic, Mirko Maksimovic, Ivana Vasovic Maksimovic, Dragi Stamenkovic, Stevan Maksimovic</i> CFD LOAD AND STRENGTH ANALYSIS OF TACTICAL UNMANNED AERIAL VEHICLE MADE FROM COMPOSITE MATERIALS	29
<i>Milena N. Rajic, Dragoljub Zivkovic, Milan S. Banic, Marko Mancic, Nenad Mitrovic, Milos Milosevic</i> EXPERIMENTAL AND NUMERICAL ANALYSIS OF HOT WATER BOILER IN START UP REGIME	30
<i>Andrijana A. Durdevic, Dorde D. Durdevic</i> STRUCTURAL ELEMENTS WITH GEOMETRIC DISCONTINUITIES-NUMERICAL AND EXPERIMENTAL DETERMINATION OF STRESS AND STRAIN STATE	31
<i>Marija N. Vuksic Popovic, Jovan D. Tanaskovic, Dejan B. Momcilovic , Vojkan J. Lucanin</i> EXPERIMENTAL RESEARCH OF MECHANICAL CHARACTERISTICS OF RAILWAY VEHICLES SAFETY COUPLING COMPONENTS	32
<i>Katarina Colic</i> THE INFLUENCING FACTORS ON THE INTEGRITY OF ORTHOPAEDIC IMPLANTS	33
<i>Aleksandra Lj. Dragicevic, Lidija R. Matija, Zoran V. Krivokapic, Boris B. Kosic, Djuro Lj. Koruga</i> POSSIBLE SOLUTION OF IMPLEMENTATION OF THE OMIS METHOD IN EXISTING COLONOSCOPE FOR IN VIVO CANCER SCREENING	34
<i>Marko Mancic, Dragoljub Zivkovic, Milena Rajic, Milena Mancic, Milan Dordevic</i> MODELING AND TECHNO-ECONOMIC OPTIMIZATION OF A COGENERATION PLANT FOR COMBUSTION OF BIOGAS	35
<i>Dragana Barjaktarevic, Bojan Medo, Veljko Dokic, Marko Rakin</i> MICROSTRUCTURE AND MECHANICAL PROPERTIES OF ANODIZED SURFACE OF ULTRAFINE-GRAINED Ti-13Nb-13Zr ALLOY FOR BIOMEDICAL APPLICATION	35

Numerical Methods.....	37
<i>Igor Dzincic</i>	
A FINITE ELEMENT MODEL OF MORTISE AND TENON JOINT	38
<i>Mirjana Perisic, Andreja Stojic, Gordana Jovanovic, Andrej Sostaric, Dimitrije Maletic, Dusan Vudragovic, Svetlana Stanisic</i>	
THE POTENTIAL FOR FORECASTING THE PARTICULATE MATTER LEVELS IN COMPLEX URBAN ENVIRONMENT.....	39
<i>Andreja Stojic, Gordana Jovanovic, Svetlana Stanisic, Andrej Sostaric, Ana Vranic, Marija Mitrovic Dankulov, Mirjana Perisic</i>	
THE IMPACT OF HUMIDITY AND TEMPERATURE ON PARTICULATE MATTER ENVIRONMENTAL FATE	40
<i>Svetlana Stanisic, Mirjana Perisic, Andreja Stojic, Andrej Sostaric, Dusan Vudragovic, Dimitrije Maletic, Gordana Jovanovic</i>	
THE IMPACT OF GASEOUS POLLUTANTS ON PARTICULATE MATTER DISTRIBUTION .	41
<i>Nikola Stupar, Ana Vranic, Andreja Stojic, Gordana Vukovic, Dusan Vudragovic, Dimitrije Maletic, Marija Mitrovic Dankulov</i>	
SPATIO-TEMPORAL ANALYSIS OF MOBILITY PATTERNS IN THE CITY OF BELGRADE .	42
<i>Gordana Jovanovic, Svetlana Stanisic, Mirjana Perisic, Andrej Sostaric, Marija Mitrovic Dankulov, Ana Vranic, Andreja Stojic</i>	
ENVIRONMENTAL FACTORS GOVERNING PARTICULATE MATTER DISTRIBUTION IN AN URBAN ENVIRONMENT	43
<i>Martina Balac, Aleksandar Grbovic</i>	
FE ANALYSIS OF THE SUPPORT ASSEMBLY OF THE PORT BAY BRIDGE	44
<i>Aleksandar Milovanovic, Aleksandar Sedmak, Ljubica Dikovic, Ljiljana Trumbulovic</i>	
FINITE ELEMENT AND FRACTURE MECHANICS ANALYSIS OF A CRACKED PRESSURE VESSEL.....	45
<i>Nikola Lj. Zivkovic, Jelena Z. Vidakovic, Mihailo P. Lazarevic</i>	
HYBRID PSO-NEWTON-RAPHSON ALGORITHM FOR INVERSE KINEMATICS PROBLEM IN ROBOTICS.....	46
<i>Aleksandra S. Kostic, Jovan D. Tanaskovic</i>	
DEVELOPMENT AND STRENGTH ANALYSIS OF THE SUB-ASSEMBLY IMPLEMENTED IN THE BEARING STRUCTURE OF THE "AVENIO" TRAM	47
<i>Nikola Mirkov, Seif Eddine Ouyahia, Sara Lahlou, Milada Pezo, Rastko Jovanovic</i>	
VALIDATION OF AN OPEN-SOURCE FINITE-VOLUME METHOD SOLVER FOR VISCOPLASTIC FLOWS	48

New Technologies	49
<i>Goran Mladenovic</i>	
DEVELOPMENT OF AN OUT OF VACUUM SOLUTION FOR PARTICLE DETECTOR ELECTRONICS USING COMMERCIAL CAD SOFTWARE	50
<i>Mihajlo Milovanovic, Petar Pejic, Jelena Pejic</i>	
SENSOR DETECTION OF HONEYCOMB CONTENT	51
<i>Andjelija Djordjevic, Marko Mihic</i>	
STRATEGIC IMPORTANCE OF SERBIAN HIGH-TECH BUSINESS INCUBATORS	52
<i>Aleksandar J. Vujovic, Jelena D. Sakovic Jovanovic</i>	
APPLICATION OF 3D TECHNOLOGIES IN THE FUNCTION OF PROTECTION OF CULTURAL HERITAGE OF MONTENEGRO	53
<i>Goran M. Mladenovic, Ljubodrag M. Tanovic, Radovan M. Puzovic, Milos D. Pjevic, Mihajlo D. Popovic, Ivana Jevtic</i>	
ROUGH MILLING WITH END MILL CUTTER IN APPLICATION FOR FREE FORM SURFACES MACHINING	54
<i>Predrag Maksic, Jelena Drobac</i>	
APPLICATION AND CHARACTER OF DESIGN FOR RECYCLING (DFR): CHALLENGES AND OPPORTUNITIES	55
<i>Ivana Jevtic, Goran Mladenovic, Milos Milosevic, Isaak Trajkovic, Milan Travica, Aleksa Milovanovic</i>	
ANALYSIS OF THE MATERIALS USABILITY IN ADDITIVE PRODUCTION TECHNOLOGIES.....	56
<i>Ivana Jevtic, Goran Mladenovic, Milos Milosevic, Isaak Trajkovic, Milan Travica, Aleksa Milovanovic, Viktor Stojmanovski</i>	
ADDITIVE TECHNOLOGY DESIGN FOR 3D PRINTING AND APPLICATION TO FAST PRODUCT DEVELOPMENT.....	57
<i>Radivoje M. Mitrovic, Aleksandar S. Sedmak, Nenad D. Zrnic, Mirjana Lj. Kijevcanin, Petar S. Uskokovic, Aleksandar M. Milivojevic, Zarko Z. Miskovic</i>	
INTRODUCTION OF WORK INTEGRATED LEARNING (WIL) IN UNIVERSITY EDUCATION IN SERBIA	58
Clear sky.....	59
<i>Ivan M. Lazovic</i>	
INFLUENCE OF THE URBAN HEAT ISLAND ON INCREASED ENERGY USE FOR COOLING OF BUILDINGS	60
<i>Marija Baltic, Toni Ivanov, Milos Vorkapic</i>	
COMPARATIVE ANALYSIS OF CONVENTIONAL DIESEL AND ELECTRIC BUS CHARACTERISTICS - TECHNICAL AND ENVIRONMENTAL ASPECTS.....	61

<i>Ivana O. Mladenovic, Marija Z. Baltic, Milos D. Vorkapic</i> CHARACTERIZATION AND ANALYSIS ADHESION OF COPPER COATINGS ELECTRODEPOSITED ON FLEXIBLE SUBSTRATES	62
<i>Jelena Svorcan, Aleksandar Kovacevic, Mohammad Sakib Hasan</i> STRUCTURAL ANALYSIS OF SMALL-SCALE COMPOSITE PROPELLER BLADE	63
<i>Dragoljub Tanovic, Aleksandar Simonovic, Ognjen Pekovic</i> NUMERICAL SIMULATION OF AIRFOILS FOR AIRBORNE WIND TURBINE	64
<i>Aleksandar Kovacevic, Jelena Svorcan, Toni Ivanov</i> PRODUCTION PROCESS OF COMPOSITE PROPELLER FOR MULTIROTOR UAV	65
<i>Mohammad Sakib Hasan, Toni Ivanov, Milos Vorkapic</i> IMPROVEMENT OF MECHANICAL CHARACTERISTICS OF PLA BY APPLYING REMELTING PROCESS.....	66
<i>Milica M. Ivanovic, Dragoljub Lj. Tanovic, Aleksandar M. Kovacevic</i> COMPARATIVE ANALYSIS OF THE THREE SYSTEMS WITH CARBON-DIOXIDE AS A WORKING FLUID FOR INDUSTRIAL REFRIGERATION	67
<i>Zorana Trivkovic, Jelena Svorcan, Marija Baltic, Nemanja Zoric, Ognjen Pekovic</i> DESIGN OF SMALL-SCALE COMPOSITE VERTICAL-AXIS WIND TURBINE BLADE	68
<i>Toni D. Ivanov, Aleksandar M. Kovacevic, Aleksandar M. Simonovic</i> DESIGN AND ANALYSIS OF OPTIMAL BLDC MOTOR PROPELLER.....	69
<i>Miroslav M Jovanovic, Nebojsa N Lukic and Aleksandar M Simonovic</i> A STUDY ON HIGH VIBRATION BEHAVIORS OF VIPER MK. 22-8 JET ENGINE	70
<i>Mladen Furtula, Gradimir Danon, Marija Durkovic, Srdan Svrzic</i> THE WOOD PELLET PRODUCTION IN SERBIA – POSSIBILITY TO IMPROVE ENERGY CONSUMPTION AND GHG EMISSIONS	71
Sustainable Design and New Technologies.....	72
<i>Zarko Z. Miskovic</i> DEVELOPMENT AND DESIGN OF THE NEW MECHANICAL VENTILATOR.....	73
<i>Rade V. Pejovic, Ana Z. Cvijanovic</i> RECYCLING AND UPCYCLING IN DESIGN.....	74
<i>Jelena Drobac, Predrag Maksic</i> EXPANDABLE AND ADAPTABLE TEXTILES FOR NEW AGE	75
<i>Dragana D. Gardasevic</i> STABILITY ANALYSIS OF VIBRATIONS IN POWER PLANT SYSTEM	76

Advanced Materials and Technology	77
<i>Aleksandra Sknepnek, Suzana Filipovic, Pavle Maskovic, Miljana Mirkovic, Dunja Miletic, Miomir Niksic, Vladimir B. Pavlovic</i>	
EFFECTS OF SYNTHESIS PARAMETERS ON STRUCTURE AND PROPERTIES OF THE CERAMIC/POLYMER FILMS BASED ON BACTERIAL CELLULOSE	78
<i>V. Buljak, V. Petrovic</i>	
CONSTITUTIVE MODELING AND CHARACTERIZATION OF CERAMIC MATERIALS	79
<i>J. Zivojinovic, V. A. Blagojevic, V. P. Pavlovic, D. Kosanovic, N. Tadic, V. B. Pavlovic</i>	
THE INFLUENCE OF MECHANICAL ACTIVATION ON MICROSTRUCTURE AND DIELECTRIC PROPERTIES OF SRTIO3 CERAMICS.....	80
<i>Ana Stankovic, Suzana Filipovic, Ivana Stojkovic Simatovic, Sreco Davor Skapin, Lidija Mancic, Smilja Markovic</i>	
BT/ZNO COMPOSITE MATERIALS WITH IMPROVED FUNCTIONAL PROPERTIES.....	81
<i>N. Obradovic, A. Peles1, J. Petrovic, D. Olcan, W. G. Fahrenholtz, A. Djordjevic, V. B. Pavlovic</i>	
MEASUREMENT OF DIELECTRIC PERMITTIVITY USING COAXIAL CHAMBERS AND ELECTROMAGNETIC-MODELING SOFTWARE.....	82
<i>N. Obradovic, S. Filipovic, N. Gilli, L. Silvestroni</i>	
PREPARATION AND CHARACTERIZATION OF ZRB2-TIB2 BASED COMPOSITES FOR HYPERSONIC SYSTEMS.....	83
<i>Zorana Golubovic, Aleksandra Mitrovic, Aleksa Milovanovic</i>	
FDM PRINTING TECHNOLOGY APPLICATIONS IN DENTISTRY	84
Artificial Intelligence	85
<i>Milica Markovic, Novak Radivojevic, Miona Andrejevic Stosovic, Jelena Markovic Brankovic, Srdjan Zivkovic</i>	
MODELING OF DAM STRUCTURAL RESPONSE USING ARTIFICIAL NEURAL NETWORKS	86
<i>Djordje Dihovichni, Nada Ratkovic Kovacevic, Zoran Lalic, Dragan Kreculj</i>	
DECISION MAKING STRATEGIES FOR VEHICLE TRACKING SYSTEM	87
<i>Petar D. Jakoljjevic, Nemanja I. Mor, Vesna M. Mihajlovic</i>	
ROBOTIC WELDING	88

Student session	89
<i>Tijana D. Lukic</i>	
POSSIBILITIES AND APPLICATIONS OF SLA AND FDM PRINTING - ADVANTAGES AND DISADVANTAGES.....	90
<i>Jovana Lazovic</i>	
ATOS CORE 200 AND GEOMAGIC CAPTURE 3D SCANNERS-ADVANTAGES AND DISADVANTAGES	91
<i>A. Dubonjac, M. Lazarevic, J. Vidakovic</i>	
IMPACT OF TRAJECTORY CONSTRAINS ON BEAIRC AND COILC CONVERGENCE RATES.....	92
<i>Djordje V. Trampa, Bozidar S. Simovic, Diana P. Sekulic, Aleksa G. Galic, Nikola D. Stojiljkovic, Toni D. Ivanov</i>	
DESIGN OF ROCKET WITH SLOSHING PAYLOAD CAPABLE OF CRUISE FLIGHT	93
<i>Bozidar S. Simovic, Djordje V. Trampa, Diana P. Sekulic, Aleksa G. Galic, Nikola D. Stojiljkovic, Toni D. Ivanov</i>	
IMPACT OF SLOSHING ON AERIAL VEHICLE DYNAMICS.....	94
<i>Milan Z. Rakic, Djordje V. Trampa, Dusan J. Lazic, Marko S. Skakun, Aleksa P. Stefanovic, Nikola D. Stojiljkovic, Toni D. Ivanov</i>	
DESIGN OF MIDDLE ALTITUDE SOLID FUEL ROCKET.....	95
<i>Dusan J. Lazic, Djordje V. Trampa, Milan Z. Rakic, Nikola B. Zlatkovic, Aleksa P. Stefanovic, Nikola D. Stojiljkovic, Toni D. Ivanov</i>	
AERODYNAMIC DESIGN OF A MIDDLE ALTITUDE SOLID FUEL ROCKET.....	96
<i>I. Mikavica, T. Sostaric¹, A. Antanaskovic, D. Randelovic, J. Petrovic, G. Jovanovic, Z. Lopacic</i>	
LEAD SORPTION FROM WASTEWATERS BY INVASIVE ACER NEGUNDO L. BIOMASS..	97
<i>Jovana Bosnjakovic, Dragan Pavlovic, Ivana Vasovic Maksimovic</i>	
POTENTIAL APPLICATIONS OF NANOMATERIALS IN THE AVIATION INDUSTRY: A REVIEW.....	98
<i>Katarina Pantovic Spajic, Branislav Markovic, Miroslav Sokic, Gvozden Jovanovic, Ksenija Stojanovic</i>	
A REVIEW OF COAL DEMINERALIZATION AND DESULPHURIZATION BY CHEMICAL LEACHING	99
<i>Anja V. Antanaskovic, Zorica R. Lopacic, Vladimir M. Adamovic, Tatjana D. Sostaric, Marica B. Rakin, Marko P. Rakin, Danijela D. Smiljanic</i>	
ASSESSMENT OF SORPTION CAPABILITY OF ALGINATE IMMOBILIZED PEACH STONE PARTICLES FOR LEAD REMOVAL FROM WATER.....	100

M. Novkovic

CONSTRUCTIONAL ASPECTS OF BUCKET WHEEL EXCAVATOR BREAKDOWN 101

Kostic Bogdan

THE BEHAVIOR OF ARMORED STEEL UNDER IMPACT LOAD..... 102

PROGRAMME

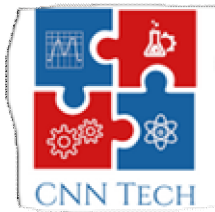
Tuesday, June 29, 2021	
19:00 to 21:00	Registration and Welcome cocktail
Wednesday, June 30, 2021	
12:00 to 13:00	Registration
13:00 to 13:30	Opening Ceremony <i>Prof dr Aleksandar Sedmak, Director of Innovation Center of Faculty of Mechanical Engineering</i> <i>dr Ivan Rakonjac – Director of Innovation Fund</i>
13:30 to 15:00	INVITED LECTURES <i>Chairman: Aleksandra Dragicevic</i> <u>Igor Dzincic</u> - A FEM ANALYSIS OF MORTISE AND TENON JOINT WITHIN CHAIRS <u>Aleksandra Sknapnek</u> - EFFECTS OF SYNTHESIS PARAMETERS ON STRUCTURE AND PROPERTIES OF TH CERAMIC/POLYMER FILMS BASED ON BACTERIAL CELLULOSE <u>Miljana Mirkovic</u> - PHASE MORPHOLOGICAL AND ANTIMICROBIAL PROPERTIES OF HAP-TIO 2 NANOMATERIALS OBTAINED BY DIFFERENT SYNTHESIS ROUTE COMPANY PRESENTATION 3D REPUBLIKA
15:00 to 15:30	Coffee break
15:30 to 17:00	INVITED LECTURES <i>Chairman: dr Goran Mladenovic</i> <u>Zarko Miskovic</u> - DEVELOPMENT AND DESIGN OF THE NEW MECHANICAL VENTILATOR <u>Emil Veg</u> - VIBRATION MONITORING, ANALYSIS AND DAMPING AT THE HYDRO POWER PLANT <u>Katarina Maksimovic</u> - DAMAGE TOLERANCE ANALYSIS OF AIRCRAFT STRUCTURAL ELEMENTS
17:00 to 18:00	Free time
18:00 to 20:00	POSTER SESSION
20:00 to 23:00	Gala dinner

Thursday, July 01, 2021

09:00 to 10:00	Registration	
10:00 to 10:30	Opening Ceremony, <i>dr Milos Milosevic – Innovation Center of Faculty of Mechanical Engineering</i> <i>dr Nenad Mitrovic – Faculty of Mechanical Engineering</i> <i>dr Ivan Rakonjac – Director of Innovation Fund</i>	
10:30 to 12:30	WORKSHOP - REGIONAL INNOVATION FORUM 2020 <i>Chairman: dr Zarko Miskovic</i> <ul style="list-style-type: none"> • Directions for the development of cooperation between science and economy, Ministry of education, science and technological development • Sources of finance for business improvements of SMEs, Development Agency of Serbia • Mechanisms for financing of research and innovation, Innovation Fond of Serbia • Horizon Europe, Chamber of Commerce and Industry of Serbia • Competition for best technological innovation • Grant-funded projects, 3D republika 	
12:30 to 13:00	Coffee break	
13:00 to 15:00	SESSION <i>Chairman: dr Martina Balac</i> Oral presentations Invited lecture - Aleksandra Markovic - MODELING OF DAM STRUCTURAL RESPONSE USING ARTIFICIAL NEURAL NETWORKS Invited lecture - Goran Mladenovic - DEVELOPMENT OF AN OUT OF VACUUM SOLUTION FOR PARTICLE DETECTOR ELECTRONICS USING COMMERCIAL CAD SOFTWARE Radivoje Mitrovic, Aleksandar Sedmak, Nenad Zrnic, Mirjana Kijevcanin, Petar Uskokovic, Aleksandar Milivojevic, Zarko Miskovic - INTRODUCTION OF WORK INTEGRATED LEARNING (WIL) IN UNIVERSITY EDUCATION IN SERBIA COMPANY PRESENTATION <ul style="list-style-type: none"> • IMW, In the function of knowledge, experience and vision, Andreja Radovanovic • TROKUT TEST GROUP, Mirjana Opacic 	B2B MEETINGS
15:00 to 16:30	POSTER SESSION	
16:30 to 18:00	Free time	
18:00 to 21:00	Dinner	

Friday, July 02 2021

From 10:00	Zlatibor excursion (optional)
------------	-------------------------------



IMPROVEMENT OF MECHANICAL CHARACTERISTICS OF PLA BY APPLYING REMELTING PROCESS

Mohammad Sakib Hasan^{1*}, Toni Ivanov¹, Milos Vorkapic²

¹University of Belgrade, Faculty of Mechanical Engineering, 11000 Belgrade, Kraljice Marije 16, Serbia

²University of Belgrade, Institute of Chemistry, Technology and Metallurgy, 11 000 Belgrade, Njegoseva 12, Serbia

*Corresponding author e-mail: sakibhasan89@yahoo.com

Abstract

In this paper, bone-shaped samples (dog bone) made of thermoplastic polymer PLA were tested according to the ASTM D638 standard. All samples were made on a WANHAO duplicator i3 plus 3D printer. PLA is the most widely used polymer mainly due to its thermoplastic workability and good mechanical properties. The mechanical characteristics of the materials were compared after the realization of the samples on the 3D printer and after the remelting process. All samples were built in horizontal orientation. Remelting process involves stacking / packing samples in a mold and pressing them with sodium chloride (NaCl) powder. Since sodium chloride (NaCl) is a poor conductor of temperature, it takes some time for the experiment to be realized in order to equalize the temperatures throughout the volume of the mold. The mold thus formed was kept at 210°C for 30-45 minutes. The purpose of salt powder molding is to get even curing without deformation on the surfaces of the parts. The samples become rougher after this treatment and it is necessary to remove excess salt from the structure as well as additional surface treatment. The remelting process proved to be very cheap, but also quite unreliable due to the slow and uneven rise in temperature in the mold. The SHIMADZU AGS-X 100 kN tensile testing machine was used to test the tensile strength of the samples. During the experiment, it was found that the samples with remelting process have a much higher tensile strength compared to the untreated samples. Remelting procedure of PLA greatly improves the mechanical properties and gives better performance to complex parts printed on a 3D printer by reducing the anisotropic characteristics of the polymer. Further research would be related to the testing of other thermoplastic materials such as ABS, PET-G etc. It would be interesting to use other materials for molding and to perform a comparative analysis of the obtained results of the new molding methods with the described method of applying salt powder.

Keywords

Additive manufacturing, FDM, PLA, Remelting process, Tensile properties.

Acknowledgement

This work was funded by Ministry of Education, Science and Technological Development of the Republic of Serbia, Grants No. 451-03-9/2021-14/200105 and 451-03-9/2021-14/200026

CIP - Каталогизacija у публикацији

Народна библиотека Србије, Београд

621(048)(0.034.2)

62:519.6(048)(0.034.2)

INTERNATIONAL Conference of Experimental and Numerical Investigations and New Technologies (2021 ; Zlatibor)

Programme [Elektronski izvor] ; and The Book of Abstracts / International Conference of Experimental and Numerical Investigations and New Technologies - CNN TECH 2021, 29 June - 02 July 2021, Zlatibor, Serbia ; organized by Innovation Center of Faculty of Mechanical Engineering [and] Faculty of Mechanical Engineering, University of Belgrade, Center for Business Trainings ; [editors Goran Mladenovic, Martina Balac, Aleksandra Dragicevic]. - Belgrade : Innovation Center of Faculty of Mechanical Engineering, 2021 (Belgrade : Innovation Center of Faculty of Mechanical Engineering). - 1 elektronski optički disk (CD-ROM) ; 12 cm

Sistemski zahtevi: Nisu navedeni. - Nasl. sa naslovne strane dokumenta. - Tiraž 100

ISBN 978-86-6060-077-8

1. Mašinski fakultet. Inovacioni centar (Beograd)

a) Машинство - Апстракти b) Техника - Нумерички методи - Апстракти

COBISS.SR-ID 41811977