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Faculty of Transport and Aviation Engineering

Transport Problems 2020

Proceedings

XII International Scientific Conference

IX International Symposium of Young Researchers

UNDER THE HONORARY PATRONAGE OF MAYOR OF KATOWICE CITY
AND RECTOR OF SILESIA UNIVERSITY OF TECHNOLOGY



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Final Program TP'2020

Monday, 30th November 2020
Katowice, Faculty of Transport (online)

- 09⁵⁵ – 14³⁰ **Plenary Session**
Chairman: prof. Aleksander SŁADKOWSKI
Scientific Secretary: prof. Grzegorz WOJNAR
- 10⁰⁰ – 10⁰⁵ Open speech
Aleksander SŁADKOWSKI, Chairman of the International Scientific Committee
- 10⁰⁵ – 10¹⁰ Greetings on behalf of the Silesian University of Technology
Arkadiusz MEŻYK
- 10¹⁰ – 10²⁵ Research and education in the broadly understood field of transport at the Silesian University of Technology
Bogusław ŁAZARZ
- 10²⁵ – 10³⁰ Greetings to the conference participants on behalf of the city of Katowice
Marcin KRUPA
- 10³⁰ – 10⁵⁰ Parking research and analysis in the city center of Katowice
Bogusław LOWAK
- 10⁵⁰ – 11¹⁰ Present and future of rail freight
Stefano RICCI
- 11¹⁰ – 11³⁰ Technology for noise control of changes in the vibration state of the railroad track
Telman ALIEV, Tofiq BABAYEV, Tahir ALIZADA, Elnur ALIBAYLI, Heybatulla AHMEDOV, Nijat ZOHRABOV

- 11³⁰ – 11⁵⁰ Transport of the future in intelligent cities
Janusz SZPYTKO
- 11⁵⁰ – 12¹⁰ Load lashing in road transport
Robert BIEGAŁA, Marcin JĘDRUSIK
- 12¹⁰ – 12³⁰ Prevention of road safety on the example of the activities of the Road Traffic Department of the Provincial Police Headquarters in Katowice
Tomasz BRATEK, Adam JAKUBCZYK
- 12³⁰ – 12⁵⁰ Current state and further development of European technical rules regarding railway safety - consequences for railway technology
Wolfgang ROESCH
- 12⁵⁰ – 13³⁵ Novel signal processing for condition monitoring and structural health monitoring
Len GELMAN
- 13³⁵ – 14⁰⁵ „Transport Problems” – journal, conference and symposium. Cooperation and mutual complementarity
Aleksander SŁADKOWSKI
- 14⁰⁵ – 14³⁰ Questions of organization of the TP'2020 Conference
Grzegorz WOJNAR, Chairman of the Organizing Committee

Tuesday, 1st December 2020
Katowice, Faculty of Transport (online)

- 09⁵⁵ – 13⁰⁰ **Session A “Problems of Rail Transport”**
Co-chairs: prof. Aleksandr RAKHMANGULOV, prof. Elżbieta MACIOSZEK
Scientific Secretary: dr. Tomasz HANISZEWSKI
- 10⁰⁰ – 10¹⁵ Options for fastening fiberglass boilers on the frame of railway tank wagons
Ramis ZARIPOV, Nurbolat SEMBAEV, Pavels GAVRILOVS
- 10¹⁵ – 10³⁰ Experimental determination of vertical and lateral loads on the bogie side frame of a freight wagon
Yuriy BORONENKO, Rustam RAHIMOV
- 10³⁰ – 10⁴⁵ Assessment of the influence of preventive maintenance on the reliability and availability indexes of diesel locomotives
Maciej SZKODA, Grzegorz KACZOR, Robert PILCH, Maksymilian SMOLNIK
- 10⁴⁵ – 11⁰⁰ Design and management of the railway infrastructure – higher education in the Slovak Republic
Janka ŠESTÁKOVÁ, Alžbeta PULTZNEROVÁ, Libor IŽVOLT
- 11⁰⁰ – 11¹⁵ Analysis of results of deformation characteristics measurements of embankments and transitions zones of a modernised line Povazska Tepla - Žilina
Libor IŽVOLT, Peter DOBEŠ
- 11¹⁵ – 11³⁰ Shperling criterion study in a passenger car with independently rotating wheels
Gediminas VAIČIŪNAS, Stasys STEIŠŪNAS
- 11³⁰ – 11⁴⁵ Planning the construction of high-speed lines in the Czech Republic and its methodological evaluation in terms of transport service of region
Pavel PURKART, Tomáš JAVOŘÍK, Lukáš TÝFA, David VODÁK
- 11⁴⁵ – 12⁰⁰ Experience gained from specific cases of application of predictive maintenance for railway rolling stock
Wolfgang ROESCH
- 12⁰⁰ – 12¹⁵ A new approach to prediction of tribological properties of wheels and rails interacting surfaces
George TUMANISHVILI, Tengiz NADIRADZE, Giorgi TUMANISHVILI

- 12¹⁵ – 12³⁰ The innovative development of the electric locomotive traction drive
Ilham HUSEYNOV
- 12³⁰ – 12⁴⁵ Simulation of train run along a selected route taking into account optimal control
Adam MAŃKA, Jarosław KONIECZNY, Piotr KISIELEWSKI
- 12⁴⁵ – 13⁰⁰ Thermal loads of railway pantographs
Andrzej HEŁKA, Adam MAŃKA
-

09⁵⁵ – 13¹⁵

Session B “Problems of Road Transport”

Co-chairs: prof. Velizara PENCHEVA, prof. Damian GAŚKA
Scientific Secretary: dr. Maria CIEŚLA

- 10⁰⁰ – 10¹⁵ Estimation of efficiency of electric power balance in automobile
Andrey PUZAKOV
- 10¹⁵ – 10³⁰ Improving the strength of the soil base roads using stabilizers
Rashidbek HUDAYKULOV, Barno SALIMOVA
- 10³⁰ – 10⁴⁵ Creating of the assembly methodology of the compressor on a car with a pneumatic chassis
Miroslav BLATNICKÝ, Ján DIŽO, Dalibor BARTA, Paweł DROŹDZIEL
- 10⁴⁵ – 11⁰⁰ Analysis of causes of damage to draw hooks used in freight car
Henryk BAŃKOWSKI, Andrzej SOKOŁOWSKI, Łukasz ŁOMOZIK
- 11⁰⁰ – 11¹⁵ Risk assessment during the transportation of dangerous goods, considering driver's functional condition
Yevhen FORNALCHYK, Maksym AFONIN, Taras POSTRANSKY, Mykola BOIKIV
- 11¹⁵ – 11³⁰ Brand equity as a determinant of cooperation growth in the road freight transport industry
Marcin ŚWITAŁA, Agnieszka ŁUKASIEWICZ
- 11³⁰ – 11⁴⁵ Technical and economic aspects of starting a selected power unit at low ambient temperatures
Jan LEWICKI, Wojciech LEWICKI
- 11⁴⁵ – 12⁰⁰ Use of surface working for improving the working life of piston valves of combustion engines
Krzysztof FILIPOWICZ, Mariusz KUCZAJ, Stanisław MIKUŁA

- 12⁰⁰ – 12¹⁵ Improvement of the organization of maintenance and repair of freight cars
Israil ELYAZOV
- 12¹⁵ – 12³⁰ Influence on use of reflective elements on road safety
Katarzyna SICIŃSKA, Anna ZIELIŃSKA
- 12³⁰ – 12⁴⁵ Design of electromechanical control of variable timing of combustion engine valves
Ján VLNKA
- 12⁴⁵ – 13⁰⁰ Computational simulations of parts of passenger vehicle
Jan KRMELA
- 13⁰⁰ – 13¹⁵ Modification of the adhesive force on a silvehicle by reducing the radial force reaction of the wheels *Petr JILEK, Jan KRMELA, Jan BERG*
-

13⁵⁵ – 17³⁰ **Session C “Problems of Intermodal Transport and Logistics”**

Co-chairs: prof. Mihaela POPA, prof. Rafał BURDZIK
Scientific Secretary: mgr Michał JUZEK

- 14⁰⁰ – 14¹⁵ Assessing the link between transport, logistics and economic growth in Kazakhstan and their impact on transport policy planning
Zhanarys RAIMBEKOV, Bakyt SYZDYKBAYEVA
- 14¹⁵ – 14³⁰ Combined/intermodal transport – the latest trends in world
Leszek MINDUR
- 14³⁰ – 14⁴⁵ The influence of the selected international organizations on the development of transport, in particular the transport in intermodal technology
Maciej MINDUR
- 14⁴⁵ – 15⁰⁰ Mathematical methods in modeling distribution cargo flows on the regional multimodal transportation market
Oleg CHISLOV, Viktor BOGACHEV, Vyacheslav ZADOROZHNIY, Alexandra KRAVETS, Taras BOGACHEV
- 15⁰⁰ – 15¹⁵ Transportation volumes as the indicators of sociodemographic and economic characteristics of certain area
Predrag RALEVIĆ, Jelena MILUTINOVIĆ, Marjana ČUBRANIĆ-DOBRODOLAC, Momčilo DOBRODOLAC

- 15¹⁵ – 15³⁰ Warehousing in the Slovenian automotive industry
Sebastijan ŠKERLIČ
- 15³⁰ – 15⁴⁵ Network of dedicated bus lanes: a solution to increase the accessibility of the urban intermodal transport network
Dorinela COSTESCU, Armand Şerban STERE
- 15⁴⁵ – 16⁰⁰ Cross-docking operations optimisation through discrete simulation
Sergiu OLTEANU, Mihaela POPA, Eugen ROŞCA, Florin-Valentin RUSCĂ, Cristina OPREA
- 16⁰⁰ – 16¹⁵ Long-term trends, strategies and forecasts for the development of rail container transport: a comparative analysis of Belarus and Poland
Jana PIERIEGUD, Maxim KOLOS
- 16¹⁵ – 16³⁰ Contour approach to p-location problem solving
Jaroslav JANÁČEK, Marek KVET
- 16³⁰ – 16⁴⁵ All-to-one strategy with diversity management for minimum p-location problem
Marek KVET, Jaroslav JANÁČEK
- 16⁴⁵ – 17⁰⁰ Conceptual model of multimodal transportation on the Caspian-Black Sea route of the new silk road (via Ukraine and Poland)
Viacheslav MATSIUK, Viktor MYRONENKO, Valerii SAMSONKIN, Andrii POZDNIAKOV
- 17⁰⁰ – 17¹⁵ "Road rules for banks": traffic flow regulation implications for banking
Henry PENIKAS
- 17¹⁵ – 17³⁰ Comparative study of collection and transportation modes of bio-degradable waste case study in the Silesian region in Poland
Mariusz WALA, Piotr NOWAKOWSKI
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13⁵⁵ – 17⁴⁵ **Session D “Problems of Water Transport and Others Transport Problems”**

Co-chairs: prof. Srećko KRILE, prof. Janusz ĆWIEK
Scientific Secretary: mgr Wojciech KAMIŃSKI

- 14⁰⁰ – 14¹⁵ Under used potential of inland waterways of the eastern part of the EU (on the example of the Republic of Lithuania)
Elena PLOTNIKOVA (LUKOŠEVIČIENĖ), Milita VIENAŽINDIENĖ

- 14¹⁵ – 14³⁰ The influence of external environment to the ferry lines and marine passenger terminals
Srećko KRILE, Nikolai MAIOROV
- 14³⁰ – 14⁴⁵ The influence of the land transport network on the size of maritime ports hinterland
Aura RUSCA, Florin RUSCA, Eugen ROSCA, Mihaela POPA, Oana DINU, Antonio PORUMBITA
- 14⁴⁵ – 15⁰⁰ Methodology for expert evaluation of multimodal schemes for transportation of goods by waterway and land transport
Asen ASENOV, Velizara PENCHEVA, Boril IVANOV
- 15⁰⁰ – 15¹⁵ Cold energy economy and cybersecurity of floating storage and regasification units: emerging trends, challenges, and opportunities
Manuela TVARONAVICIENE, Tomas PLETA, Vigaile SEMASKAITE, Tatjana PAULAUSKIENE, Kristina VAICIUTE
- 15¹⁵ – 15³⁰ Navigation in ice and icing of vessels in the southeastern part of the Baltic Sea
Vytautas DUBRA
- 15³⁰ – 15⁴⁵ Assessment of maritime transport sector attractiveness on the Eastern coast of Baltic sea
Elena VALIONIENĖ
- 15⁴⁵ – 16⁰⁰ Increasing the interest in cycling transport as an alternative for mobility and tourism in urban areas in Bulgaria
Mariya STANKOVA, Svetoslav KALEYCHEV
- 16⁰⁰ – 16¹⁵ Fatigue of DOCOL 1200M welds to mobile platform structures
Bożena SZCZUCKA-LASOTA, Tomasz WĘGRZYN, Tadeusz SZYMCZAK, Adam JUREK, Jan PIWNIK, Krzysztof Ireneusz WILCZYŃSKI
- 16¹⁵ – 16³⁰ Comparison of the intensity of abrasive wear of stellite 6 and Fe₃Al
Bożena SZCZUCKA-LASOTA, Wojciech TARASIUK, Krzysztof GARBALA, Piotr CYBULKO, Wojciech MAJEWSKI
- 16³⁰ – 16⁴⁵ Welding of pins to mobile platforms with micro-jet colling
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- 16⁴⁵ – 17⁰⁰ Multiple solutions and energy harvesting efficiency from vibrating mechanical systems
Jerzy MARGIELEWICZ, Damian GAŚKA, Tomasz HANISZEWSKI
- 17⁰⁰ – 17¹⁵ QZEH - quazi zero energy harvester
Jerzy MARGIELEWICZ, Damian GAŚKA
- 17¹⁵ – 17³⁰ Spherical pendulum with a flexible rope model studies
Jerzy MARGIELEWICZ, Damian GAŚKA, Tomasz HANISZEWSKI
- 17³⁰ – 17⁴⁵ Identification of chaotic motion zones of modified spherical pendulum forced in three axes *Damian GAŚKA, Jerzy MARGIELEWICZ*

Wednesday, 2nd December 2020
Katowice, Faculty of Transport (online)

- 09⁵⁵ – 13⁰⁰ **Session E “Technological and Environment Aspects”**
Co-chairs: prof. Irina MAKAROVA, prof. Piotr NOWAKOWSKI
Scientific Secretary: dr. Tomasz HANISZEWSKI
- 10⁰⁰ – 10¹⁵ Studying the dynamic system “tire-suspension-body”
by resonance method
Phridon GOGIASHVILI, David KBILASHVILI, Jumber CHOGOVDZE, Gocha LEKVEISHVILI, Besik SIRBILADZE
- 10¹⁵ – 10³⁰ Prospects for the use of second generation biofuels in
Lithuania
Gintaras VALEIKA, Jonas MATIJOŠIUS
- 10³⁰ – 10⁴⁵ Investigation of the influence of hydrogen on the
energy performance of a spark ignition engine using
gasoline and bioethanol fuel mixtures *Gabrielius MEJERAS, Alfredas RIMKUS, Jonas MATIJOŠIUS*
- 10⁴⁵ – 11⁰⁰ Computing model for simulation the pollution
dispersion near the road with noise barriers
Mykola BILIAIEV, Oleksandr PSHINKO, Tetiana RUSAKOVA, Viktoriia BILIAIEVA, Aleksander SŁADKOWSKI
- 11⁰⁰ – 11¹⁵ Increasing the working environment ergonomicity in
transport systems
Irina MAKAROVA, Polina BUYVOL, Aleksey BOYKO, Eduard TSYBUNOV, Anton PASHKEVICH

- 11¹⁵ – 11³⁰ Intelligent information system for the verification vehicle design manufacturability on project stage
Irina MAKAROVA, Polina BUYVOL, Vadim MAVRIN, Eduard MUKHAMETDINOV
- 11³⁰ – 11⁴⁵ Energy and CO₂ emissions intensity of passenger transport means in Warsaw
Wojciech SZYMALSKI
- 11⁴⁵ – 12⁰⁰ Synergy approach to creation of automated workplaces of railway transport specialists of the republic of Kazakhstan
Saule BEKZHANOVA, Botakoz ISINA, Zhanar ALTAEVA, Gulzhan MURATBEKOVA
- 12⁰⁰ – 12¹⁵ Methods for identification of complex industrial control objects on their accelerating characteristics
Aidana KALABAYEVA, Murat ADAMBAYEV, Seidulla ABDULLAYEV, Gabit BAKYT
- 12¹⁵ – 12³⁰ Application of general principles of nonequilibrium thermodynamics for the analysis of highly dynamic combustion processes in transport
Beybit MYRZAKHMETOV, Aleksander SŁADKOWSKI, Rasulbek MUSABEKOV
- 12³⁰ – 12⁴⁵ Method for computational modeling of jet pump operation modes for transport of productive uranium solutions
Beybit MYRZAKHMETOV, Aleksander SŁADKOWSKI, Saltanat TOKTAMISSOVA
- 12⁴⁵ – 13⁰⁰ Analysis of passenger train running stability on dual gauge track curves of line "Rail Baltica"
Gintautas BUREIKA, Darius VALBA
-

- 09⁵⁵ – 13⁰⁰ **Session F “Problems of Urban Transport”**
Co-chairs: prof. Zhanarys RAIMBEKOV, prof. Jarosław KONIECZNY
Scientific Secretary: dr. Maria CIEŚLA
- 10⁰⁰ – 10¹⁵ The impact of park-and-ride on public transit ridership
Joseph M. POGODZINSKI, John S. NILES
- 10¹⁵ – 10³⁰ Improving urban development methods for the formation of urban transport system
Sergey MOCHALIN, Eduard SAFRONOV, Kirill SAFRONOV, Oleg NIKIFOROV
- 10³⁰ – 10⁴⁵ Influence of information exchange on choice in some types multimodal public transport system

- 10⁴⁵ – 11⁰⁰ *Sergey VIKHAREV, Maxim LYAPUSTIN*
Improving the efficiency of vehicle operation and its environmental friendliness within the controlled crossings
- 11⁰⁰ – 11¹⁵ *Serhii TURPAK, Vjacheslav TRUSHEVSKY, Olexiy KUZ'KIN, Sergey GRITCAY, Igor TARAN*
Formation of bicycle traffic logistics on the example of an urban agglomeration of the Russian Federation
- 11¹⁵ – 11³⁰ *Anastasia SHEVTSOVA, Alina BURLUTSKAYA, Svetlana SHEKHOVTSOVA*
Survey on pedestrians and drivers' attitudes at the area of pedestrian crossings
- 11³⁰ – 11⁴⁵ *Maria DĄBROWSKA-LORANC, Katarzyna SICIŃSKA*
Drivers' speed behavior in the vicinity of additionally illuminated pedestrian crossings
- 11⁴⁵ – 12⁰⁰ *Robert ZIÓŁKOWSKI*
Vehicle cycle hierarchization model to determine the order of battery electric bus deployment in public transport
- 12⁰⁰ – 12¹⁵ *Krzysztof KRAWIEC*
Application of four-step travel demand model for planning sustainable transport of the city of Split
- 12¹⁵ – 12³⁰ *Danijela BARIĆ, Matej PAVIĆ*
Forecasting the load on night bus lines on the example of the Municipal Transport Company in Piła
- 12³⁰ – 12⁴⁵ *Piotr GORZELAŃCZYK, Ida POLAK*
Improving the safety of transportation of injured persons, taking into account biomechanical characteristics of the human body
- 12⁴⁵ – 13⁰⁰ *Phridon GOGIASHVILI, Revaz LEKVEISHVILI, Gocha LEKVEISHVILI*
Robust simulation method of complex technical transport systems
- Janusz SZPYTKO, Yorlandys SALGADO DUARTE*

13⁵⁵ – 16⁴⁵

Session G “Research of Young Scientists 1”

Co-chairs: prof. Igor TARAN, prof. Damian HADRYŚ

Scientific Secretary: mgr Michał JUZEK

14⁰⁰ – 14¹⁵

Review of design solutions for bicycle assist drives
*Tomasz OGNIK, Michał SOLIŃSKI, Michał SZCZYGIEŁ,
Krystyna MAŁEK, Wiktor MAĆKOWIAK, Damian HADRYŚ*

14¹⁵ – 14³⁰

Comparison of traction properties of bicycles with electric assistance and conventional bicycles
Michał SZCZYGIEŁ, Michał SOLIŃSKI, Damian HADRYŚ

14³⁰ – 14⁴⁵

Characteristics of the seizure process of air compressor pistons of automotive vehicles
Damian HADRYŚ, Wioletta CEBULSKA

14⁴⁵ – 15⁰⁰

Conditions for effective using and control of the power unit of an electric vehicle with on-board charging
Mariia VESELA, Olena TRETIAK

15⁰⁰ – 15¹⁵

The impact of the mutual overlap coefficient on the friction characteristics of the disk brake model in the effective heat removal conditions
*Yury KRIVOSHEYA, Yury OSENIN, Vadim ANTOSHKIN,
Alexei CHESNOKOV*

15¹⁵ – 15³⁰

Analysis of intermodal transport on the example of Euroterminal in Sławków
Katarzyna MARKOWSKA, Monika WAŁASZEK

15³⁰ – 15⁴⁵

The impact of protected areas on the designing of expressways
Katarzyna MARKOWSKA, Damian CIESIELSKI

15⁴⁵ – 16⁰⁰

The purpose of using and selection of protective clothing for a warehouse worker
Katarzyna MARKOWSKA, Patrycja STRUZIŁ

16⁰⁰ – 16¹⁵

Analysis of the road traffic volume distribution in holidays and workdays on selected road transport network elements
Elżbieta MACIOSZEK, Agata KUREK

16¹⁵ – 16³⁰

Analysis of selected operating parameters of a gearbox with non-parallel axes using geometric models of gears
Michał JUZEK

16³⁰ – 16⁴⁵ DLC coatings in the regeneration of diesel engine fuel injectors
Damian HADRYŚ, Marek JASIOK

13⁵⁵ – 16⁴⁵ **Session H “Research of Young Scientists 2”**

Co-chairs: prof. Gintautas BUREIKA, prof. Henryk BĄKOWSKI
Scientific secretary: mgr Wojciech KAMIŃSKI

14⁰⁰ – 14¹⁵ Enhancement of Northern sea route port infrastructure based on the sustainable development principles
Aleksandra PENKOVA, Oleg FRIDRIKHSO

14¹⁵ – 14³⁰ Modeling China's dry ports cooperation in supply chains
Aleksandr RAKHMANGULOV, Egor PLOTNIKOV

14³⁰ – 14⁴⁵ RFID technology application as a process of quality management improvement
Patrycja SOSNA, Sandra KUŚNIERZ, Maria CIEŚLA

14⁴⁵ – 15⁰⁰ Supporting the collection of waste personal protective equipment using a mobile app
Dawid MAJ, Sandra KUŚNIERZ, Patrycja SOSNA, Jakub MAUER, Piotr NOWAKOWSKI

15⁰⁰ – 15¹⁵ Estimate of interrelation between development of metro and city area of Ekaterinburg
Dmitry USHAKOV, Dmitry KARELIN

15¹⁵ – 15³⁰ Determination of the influence of selected factors on the volume of freight transport on railway lines in various regions of Poland
Wojciech KAMIŃSKI

15³⁰ – 15⁴⁵ Socio-economic impact assessment of the prospective new railway line in Slovenia
Andrej GULIČ

15⁴⁵ – 16⁰⁰ Use dependencies between freight prices and economic factor as a solution in improve efficiency work in road transport
Artur BUDZYŃSKI

16⁰⁰ – 16¹⁵ Modelling the shock absorber piston valve using 2-way fluid-structure interaction
Daniel BUCZKOWSKI, Grzegorz NOWAK

16¹⁵ – 16³⁰ Analysis of the possibility of using unmanned aerial vehicle in the search and rescue activities
Bartosz STOŁTNY, Grzegorz PERUŃ

16³⁰ – 16⁴⁵

Research on vibroacoustic signals recorded during the
passage of rail vehicles

Paweł SŁOWIŃSKI

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Conference Program

Monday, 30 November 2020

Katowice - online

9.55 – 10:00 Registration (Katowice, online)

10.00 – 14:30 Opening session (Katowice, online)

Tuesday, 1 December 2020

Katowice - online

9.55 – 13:15 Presentations in sections (section A and B)

13.00 – 14.00 – Lunch time

14.00 – 17:45 Presentations in sections (section C and D)

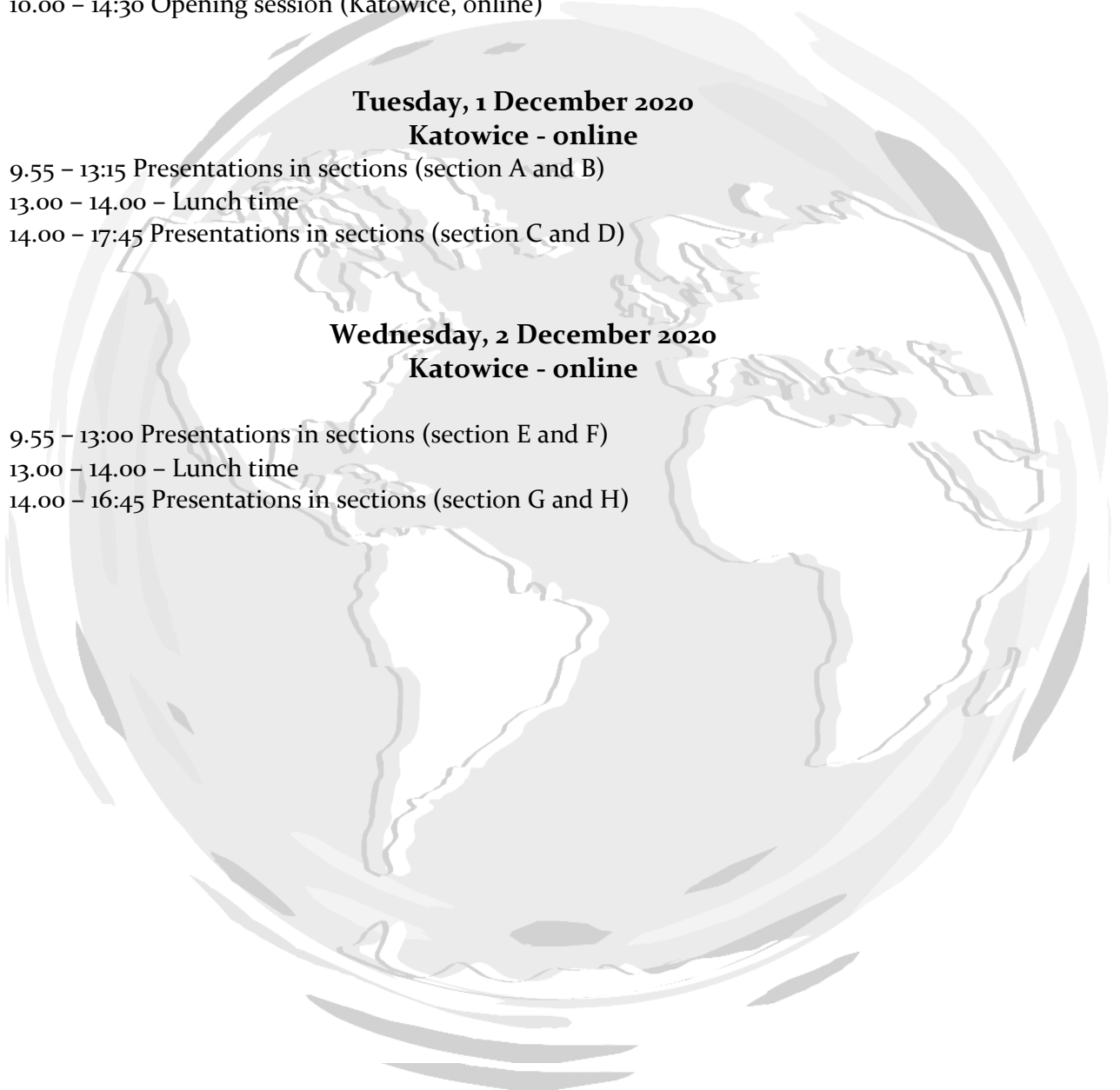
Wednesday, 2 December 2020

Katowice - online

9.55 – 13:00 Presentations in sections (section E and F)

13.00 – 14.00 – Lunch time

14.00 – 16:45 Presentations in sections (section G and H)



CONFERENCE PROCEEDINGS

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