

Oral Programme

Monday 3 September 2018	
15:00-17:00	Registration Room: Hall Auditorium
Room	Auditorium
17:00-17:10	Opening Session Professor João Pombo Professor Yoshihiro Suda
17:10-17:50	[KN.01] The role of energy absorbing materials in heavy haul rail for minimising track degradation B. Indraratna*, F.B. Ferreira, Y. Qi, Q. Sun, <i>University of Wollongong, Australia</i>
17:50-18:30	[KN.02] Curving safety against flange climb derailments and wheel/rail contact problems - Japanese experiences and safety measures A. Matsumoto, <i>Nihon University, Japan</i>
18:30-20:00	Welcome Drinks Reception Room: Hall Auditorium & Atrium

Tuesday 4 September 2018							
08:30-10:30	Session A1: SS08 - Geotechnical Aspects in Rail-Track Performance	Session B1: R04 - Modelling and Simulation of Railway Vehicles	Session C1: SS24 - Train Aerodynamics	Session D1: SS07 - Pantograph-Catenary Interaction	Session E1: R07 - Condition Monitoring and Maintenance Planning	Session F1: SS33 - Smart Operations & R05 - Rail Transport Planning & Operations Management	Session G1: SS31 - Challenges to Ensuring a Skilled Workforce for Rail Systems & SS22 - Inter-Modal Traffic, Terminals and Logistics
Session Chair	António G. Correia Yoshitsugu Momoya	Yoshihiro Suda Ingo Kaiser	Hassan Hemida Guowei Yang	Jorge Ambrósio Alan Facchinetti	Uday Kumar Yujin Lim	Rattapoohm Parichatprecha Leonardo M. Vianna	Marin Marinov Jean-Christophe Meunier & Stefano Ricci Milos Milenkovic
Room	Tramuntana	Garbi 1	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 1	Llevant 2
08:30-08:45	[A1.01] Development of FWD system to	[B1.01] Validation methodology	[SL.01] Aerodynamic design of China	[D1.01] Dynamic response	[SL.02] Development and operation	[F1.01] New transport arrangements	[G1.01] Evaluation of a training course

	<p>measure the stiffness of railway track Y. Momoya*, H. Tanigawa, T. Nakamura, K. Ito, <i>Railway Technical Research Institute, Japan</i></p>	<p>for rail vehicle dynamics models: From theory to practice O. Polach*¹, G. Götz², ¹Self-Employed Consultant, Switzerland, ²DB Regio AG, Germany</p>	<p>high-speed train S.S. Ding*, J. Du, J.L. Liu, G.B. Li, <i>CRRC Qingdao Sifang Co. Ltd., China</i></p>	<p>dependency on the train direction for railway catenary systems P. Nāvik*, S. Derosa, A. Rønquist, <i>Norwegian University of Science and Technology, Norway</i></p>	<p>of a track condition monitoring system for regional railway H. Tsunashima*¹, M. Odashima², Y. Hayashida², H. Mori³, T. Takata⁴, ¹Nihon University, Japan, ²Graduate School of Nihon University, Japan, ³National Traffic Safety and Environment Laboratory, Japan, ⁴KYOSAN ELECTRIC MFG. CO., LTD., Japan</p>	<p>using ICT S. Sakairi, <i>East Japan Railway Company, Japan</i></p>	<p>on rail freight and logistics M. Wajcharejyothin, M.V. Marinov*, <i>New castle University, UK</i></p>
08:45-09:00	<p>[A1.02] Non-linear behaviour of railway subgrade close to critical velocity K. Dong¹, O. Laghrouche¹, J. Pombo¹, D.P. Connolly*², P.K. Woodward², P. Alves Costa³, ¹Heriot Watt University, UK, ²University of Leeds, UK, ³University of Porto, Portugal</p>	<p>[B1.02] Dynamical analysis of an air spring with an integrated energy harvesting system D. Catelani², A. Genovese¹, S. Strano*¹, M. Terzo¹, ¹University of Naples Federico II, Italy, ²MSC Software srl, Italy</p>		<p>[D1.02] Numeric analysis of pantograph-catenary interaction in curved railway tracks P. Antunes*^{1,2}, J. Ambrósio¹, J. Pombo², A. Facchinetti³, ¹Instituto Superior Técnico, Portugal, ²University of Huddersfield, UK, ³Politecnico di Milano, Italy</p>		<p>[F1.02] Studies on a fundamental assumption for the real-time railway traffic management problem P. Pellegrini, P. Hosteins*, J. Rodriguez, <i>IFSTTAR, France</i></p>	<p>[G1.02] Future training and education needs in the transportation sector: Results from the SKILLFUL project A. Ahern*¹, J-C. Meunier², M. Loukea³, E. Bekiaris³, ¹University College Dublin, Ireland, ²VIAAS, Belgium, ³CERTH, Greece</p>
09:00-09:15	<p>[A1.03] Effect of a new type of elastic ballast on track performance: Large-scale laboratory study</p>	<p>[B1.03] Prediction of rollingstock derailment under cyclical cross - wind conditions according to</p>	<p>[C1.01] Virtual homologation of high-speed trains running in tunnels using an iterative numerical</p>	<p>[D1.03] Modelling of the pantograph-catenary arcing P. Xu, G.Q. Gao*, W.F. Wei, Z.F. Yang, G.N. Wu, <i>Southwest</i></p>	<p>[E1.01] Smart and resilient system for a conditioned predictive maintenance of railway</p>	<p>[F1.03] Studies on a fundamental assumption for the real-time railway traffic management problem</p>	<p>[G1.03] Emerging and future trends for job and education in intermodal transport: Results from the</p>

	M. Sol-Sánchez* ¹ , F. Moreno-Navarro ¹ , M.C. Rubio-Gámez ¹ , N. Manzo ² , V. Fontserè ² , ¹ Universidad de Granada (LabIC.UGR, Spain, ² COMSA, Spain	the wheel unloading criteria of the TSI in EU G.Y. Kim ¹ , J.S. Koo* ¹ , J.H. Rho ² , ¹ Seoul National University of Science and Technology, Republic of Korea, ² Hyundai Rotem Company, Republic of Korea	algorithm E. Brambilla, C. Somaschini*, D. Rocchi, P. Schito, G. Tomasini, <i>Politecnico di Milano, Italy</i>	<i>Jiaotong University, China</i>	infrastructures M. Morata, N. Manzo, J. Peset, V. Fontserè, G. Soley*, COMSA, Spain	P. Pellegrini, P. Hosteins*, J. Rodriguez, <i>IFSTTAR, France</i>	SKILLFUL focus-group workshop on intermodality J.C. Meunier* ¹ , A. Golfetti ² , L. Napoletano ² , ¹ Vias Institute, Belgium, ² Deep Blue, Italy
09:15-09:30	[A1.04] Behaviour of geogrid-reinforced ballast under impact loading conditions F.B. Ferreira* ¹ , B. Indraratna ¹ , A. Shahkolahi ² , ¹ University of Wollongong, Australia, ² Global Synthetics, Australia	[B1.04] Calibration of the numerical model of a freight wagon based on dynamic tests D. Ribeiro ¹ , R. Silva* ² , P. Jorge ² , R. Calçada ² , C. Costa ³ , ¹ Polytechnic of Porto, Portugal, ² University of Porto, Portugal, ³ Polytechnic Institute of Tomar, Portugal	[C1.02] Train resistance full-scale test vs. EN 14067-4:2013 (E) S. Sperling*, M. Weise, B. Schulz, <i>Bombardier Transportation, Germany</i>	[D1.04] Dynamic response analysis of pantograph-catenary system with the use of nonlinear cable model of the catenary D. Bryja*, A. Popielek, <i>Wrocław University of Science and Technology, Poland</i>	[E1.02] Risk-based railway maintenance management: Case studies from infrastructure and rolling stock F. Dinmohammadi, B. Alkali*, <i>Glasgow Caledonian University, UK</i>	[F1.04] Basic research of quantitative evaluation index for train schedule revision M. Suagasawa*, S. Sakairi, <i>East Japan railway Company, Japan</i>	[G1.04] Comparative studies for evaluating skills development in rail and other transport modes M.V. Marinov, <i>Newcastle University, UK</i>
09:30-09:45	[A1.05] Analysis of the bearing capacity and long-term deformations of	[B1.05] The influence of aerodynamic loads on vehicle dynamic	[C1.03] Aerodynamic design of a competitive freight wagon E. Öngüner*, A.	[D1.05] A self-adaptive variable-length ANCF cable element method for the	[E1.03] The scheduling of electric rolling stock maintenance under limited	[F1.05] Non-periodic train timetable structure optimization in China	[G1.05] A cooperative distributed model predictive control

	<p>unbound granular material mixed with Tire-Derived Aggregates for use as railway subballast layer</p> <p>C. Hidalgo Signes*, P. Martínez Fernández, M.E. Garrido de la Torre, R. Insa Franco, <i>Universitat Politècnica de València, Spain</i></p>	<p>performance, with performance degradation</p> <p>C.Y. Li*, W.H. Zhang, D.L. Song, <i>Southwest Jiaotong University, China</i></p>	<p>Henning, C. Wagner, <i>German Aerospace Center (DLR), Germany</i></p>	<p>form-finding analysis of the railway catenary</p> <p>C.J. Yang, H.M. Zeng*, W.H. Zhang, <i>Southwest Jiaotong University, China</i></p>	<p>resources</p> <p>V.G. Sidorenko¹, M.A. Kyaw*², <i>National Research University Higher School of Economics, Russia</i>, <i>Russian University of Transport, Russia</i></p>	<p>C.A. Xu*^{1,2}, C.C. Zou¹, S.Q. Ni¹, <i>Southwest Jiaotong University, China</i>, <i>Centre Interuniversitaire de Recherche, sur les Réseaux d'Entreprise, la Logistique et le Transport (CIRRELT), Canada</i></p>	<p>approach based on game theory for cargo consolidation process in proximity terminal network</p> <p>M. Milenkovic*^{1,2}, N. Bojovic¹, S. Val², <i>The Faculty of Transport and Traffic Engineering, Serbia</i>, <i>Zaragoza Logistics Center, Serbia</i></p>
09:45-10:00	<p>[A1.06] Development of a web-based data sharing and management platform to improve accuracy and reliability of elastoplastic constitutive model</p> <p>T. Okayasu*¹, M. Katayama¹, T. Nakamura², I. Kijiyama², T. Ishikawa³, <i>Kyushu University, Japan</i>, <i>Railway Technical Research Institute, Japan</i>,</p>	<p>[B1.06] Validation of the multi-body model of freight wagon according to procedure defined by standard EN 14363</p> <p>T. Zaluski*, G. Fira, <i>EC-Engineering Sp. z o. o., Poland</i></p>	<p>[C1.04] Aerodynamic optimization design for high-Speed train nose</p> <p>D.W. Chen*, S.B. Yao, P. Lin, <i>CRRC Qingdao Sifang Co., Ltd., China</i></p>	<p>[D1.06] Continuous Wavelet Transform analysis on railway catenary field measurements for the study of wave propagation</p> <p>S. Derosa*¹, P. Nåvik¹, A. Collina², A. Rønquist¹, <i>NTNU, Norway</i>, <i>Politecnico di Milano, Italy</i></p>	<p>[E1.04] Operation and maintenance issues of top of rail friction modifier systems at a heavy haul line</p> <p>S.A. Khan*, T. Nordmark, J. Lundberg, C. Stenström, <i>Luleå University of Technology, Sweden</i></p>	<p>[F1.06] Capacity effects of energy efficient train driving methods on the railway network operated according to the periodic timetable principles</p> <p>M. Sojka, <i>ETH Zuerich, Switzerland</i></p>	<p>[G1.06] Functional specifications for integrated and real-time yard and network management</p> <p>R. Liu*, A. Whiteing, H. Ye, F. Zhang, <i>University of Leeds, UK</i></p>

	³ Hokkaido University, Japan						
10:00-10:15	<p>[A1.07] Permanent deformation of the subgrade soil induced by a train passage in the ballasted and ballastless tracks A. Ramos*¹, A. Gomes Correia¹, R. Calçada², P. Alves Costa², ¹University of Minho, Portugal, ²University of Porto, Portugal</p>	<p>[B1.07] Verification of railway vehicle models by stationary eigenmode analysis T-R. Lopenen*¹, P. Salmenperä², A. Nurmikolu³, ¹Tampere University of Technology, Finland, ²VR Track Oy, Finland, ³Trackwise Oy, Finland</p>	<p>[C1.05] Aerodynamic shape design of train based on genetic factor theory P. Ji*^{1,2}, F. Wu^{1,2}, T.T. Wang^{1,2}, Y. Tao^{1,3}, R.Z. Xu^{1,3}, ¹Key Laboratory of Traffic Safety on Track (Central South University), Ministry of Education, China, ²Joint International Research Laboratory of Key Technology for Rail Traffic Safety, China, ³National & Local Joint Engineering Research Center of Safety Technology for Rail Vehicle, China</p>	<p>[D1.07] Contact force measurements along the Norwegian railway line, statistical analysis of dynamic interaction over several years A. Rønquist*, P. Nåvik, S. Derosa, Norwegian University of Science and Technology, NTNU, Norway</p>	<p>[E1.05] Research on optimization of planned maintenance cycle of high speed train`s bogie Z.L. Geng*, W.H. Zhang, D.L. Song, Y.C. Zeng, Southwest Jiaotong University, China</p>	<p>[F1.07] Implementation of a high frequent timetable by adjusting running speed of express trains and its verification using microscopic simulation Y. Ochiai*¹, N. Tomii¹, ¹Odakyu Electric Railway, Japan, ²Chiba Institute of Technology, Japan</p>	<p>[G1.07] Distribution of iron ore lots from railway to port: An approach using discrete events simulation R. Vieira^{1,2}, M. Cruz*¹, J.L. Felix¹, ¹Federal University of Espirito Santo, Brazil, ²Vale Cia, Brazil</p>
10:15-10:30	<p>[A1.08] The influence of sleeper material characteristics on track behaviour: A</p>	<p>[B1.08] The influence of the length of motor hanging beam on the</p>	<p>[C1.06] Numerical and experimental analysis of aerodynamic and</p>	<p>[D1.08] Study on stress distribution of railway contact wire located at registration arm</p>	<p>[E1.06] Cost-driven and reliability-driven analyses of the Y25 bogie to identify needs</p>	<p>[F1.08] Influences of station facilities on high-speed rail patronage: Toward user-</p>	<p>[G1.08] Maximizing profit with resource constraint and high demand</p>

	<p>laboratory comparison between a concrete and a composite sleeper E. Ferro*, L. Le Pen, W. Powrie, University of Southampton, UK</p>	<p>dynamics performance of vehicle X. Kun*, Z. Jing, State Key Laboratory of Traction Power, China</p>	<p>thermodynamic fields for high-speed sleeper train B. Liu*¹, S.X. Sun¹, J.F. Jin¹, F.H. Xi¹, ¹CRRC Tangshan Co., Ltd., China, ²Lanzhou City University, Chile</p>	<p>Z. Xu*, Z. Liu, Y. Song, W. Chu, J. Zhang, South West Jiaotong University, China</p>	<p>and opportunities for predictive maintenance A. Polenghi*¹, D. Shi², D. Regazzi³, P. Hyde⁴, L. Fumagalli¹, S. Bruni¹, ¹Politecnico di Milano, Italy, ²Technische Universität Berlin, Germany, ³Lucchini RS S.p.A., Italy, ⁴Newrail - Newcastle University, UK</p>	<p>centred transit station design A. Sirikijpanichkul, Kasetsart University, Thailand</p>	<p>for logistics services R. Santos*², E. Jenz^{1, 2}, C. Ruiz^{1, 2}, ¹IME, Brazil, ²MRS Logistics, Brazil</p>
10:30-10:45		<p>[B1.09] Secondary active suspension with lateral and vertical coupled control on railway vehicle Y.C. Zeng*, W.H. Zhang, D.L. Song, Southwest Jiaotong University, China</p>			<p>[E1.07] MRO system application for high-speed train based on whole lifecycle W. Hao*, C. Wang, B. He, CRRC Qingdao Sifang Co., Ltd., China</p>		<p>[G1.09] Measuring performances of Multi-Mode Marshalling Yards M. Antognoli, R. Licciardello*, S. Ricci, E. Tombesi Sapienza Università di Roma - DICEA - Transport</p>
10:30-11:00	Coffee Break / Refreshments Room: Hall Auditorium & Atrium						
11:00-13:00	<p>Session A2: SS08 - Geotechnical Aspects in Rail-Track Performance</p>	<p>Session B2: R04 - Modelling and Simulation of Railway Vehicles</p>	<p>Session C2: SS24 - Train Aerodynamics</p>	<p>Session D2: SS07 - Pantograph-Catenary Interaction</p>	<p>Session E2: R07 - Condition Monitoring and Maintenance Planning</p>		
Session Chair	António G. Correia Yoshitsugu Momoya	Yoshihiro Suda Naim Kuka	Hassan Hemida Guowei Yang	Jorge Ambrósio Anders Rønquist	Uday Kumar Hitoshi Tsunashima		

Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
11:00-11:15	<p>[A2.01] Soil shakedown analysis in slab railway tracks: A simple numerical approach P. Alves Costa^{*1}, P. Lopes^{1,2}, A. Silva Cardoso¹, R. Calçada¹, ¹University of Porto, Portugal, ²Polytechnic Institute of Porto, Portugal</p>	<p>[SL.03] The combined influence of wheel-rail geometry and of structural flexibilities of wheelsets and rails on the running behaviour of a railway vehicle I. Kaiser[*], J. Vinolas, Universidad Antonio de Nebrija, Spain</p>	<p>[C2.01] Aerodynamic drag measurement of high-speed trains in moving model experiments J.R. Bell^{*1}, K. Ehrenfried¹, C. Wagner^{1,2}, ¹Deutsches Zentrum für Luft- und Raumfahrt (DLR), Germany, ²Technische Universität Ilmenau, Germany</p>	<p>[D2.01] The effect of train roof boundary layer on pantograph uplift force G. Bucca, M. Carnevale[*], A. Facchinetti, D. Rocchi, Politecnico Di Milano, Italy</p>	<p>[E2.01] A comparative NDT test study for detecting a gap under railway concrete slab track Y. Lim^{*1}, J.W. Lee², S.J. Lee², C.Y. Choi², H. Cho³, T.N. Vu¹, ¹Paichai University, Republic of Korea, ²KRRI, Republic of Korea, ³Total Geo Solution, Republic of Korea</p>
11:15-11:30	<p>[A2.02] Adaptive finite element modelling of deteriorated railway track due to accumulated plastic deformation Y. Kim¹, S-H. Lee², I-H. Lee², Y-H. Jung^{*1}, ¹Kyung Hee University, Republic of Korea, ²Korea Railway Research Institute, Republic of Korea</p>		<p>[C2.02] Comparative analysis of wake characteristics among high-speed trains and different maglev trains Z.X. Sun[*], G.W. Yang, Y.F. Yao, W. Liu, Chinese Academy of Sciences, China</p>	<p>[D2.02] Prediction/Evaluation of the fluid force acting on a vibrating square cylinder such as the collector head and the slider for a current collector of High-speed train K. Nakamura^{*1}, Y. Shibasaki¹, M. Adachi¹, A. Iida², ¹Centel Japan Railway Company, Japan, ²Toyohashi University of Technology, Japan</p>	<p>[E2.02] On-board condition monitoring of high-speed train bogie during routine operations X. Wang[*], Y.Q. Ni, The Hong Kong Polytechnic University, Hong Kong</p>
11:30-11:45	<p>[A2.03] Evaluating the ground vibration characteristics of floating slab track for high-speed rail S. Fuchigami[*], T. Watanabe, T. Takahashi, Y. Momoya, Railway Technical Research</p>	<p>[B2.01] A theoretical study on a rail stress monitoring method using rail lateral displacement observed by commercial trains K. Abe^{*1}, S. Chiba¹, Y. Komatsu², K.</p>	<p>[C2.03] Effect of wake flow on the stability of high-speed trains S.B. Yao[*], J.C. Zou, D.W. Chen, P. Lin, CRRC Qingdao Sifang Co., Ltd., China</p>	<p>[D2.03] A catenary dynamic height visual recognition algorithm W.J. Yang[*], N. Zhou, D. Zou, W.H. Zhang, Southwest Jiaotong University, China</p>	<p>[E2.03] Practical and efficient condition monitoring of rail vehicle suspension E.M. Vinberg, M. Martin, A.H. Firdaus, A. Qazizadeh, T.M. Karis, V.V.</p>

	<i>Institute, Japan</i>	Koro ¹ , ¹ Niigata University, Japan, ² East Japan Railway Company, Japan			Krishna*, KTH Royal Institute of Technology, Sweden
11:45-12:00	[A2.04] Diagnosis of expansive rock diseases at the bottom of high speed railway tunnel and its impact analysis Z.J. Dai*, S.X. Chen, F. Yu, H.M. Luo, J. Li, Z. Zhou, <i>Chinese Academy of Sciences, China</i>	[B2.02] Analysis of railway curve squeal through improved models of the wheelset and the track J. Giner-Navarro*, J. Martínez-Casas ¹ , F.D. Denia ¹ , L. Baeza ² , ¹ Universitat Politècnica de València, Spain, ² University of Southampton, UK	[C2.04] Modal analysis of wake flow of high-speed train based on proportional orthogonal decomposition and dynamic mode decomposition W. Liu* ^{1,2} , D.L. Guo ^{1,2} , G.W. Yang ^{1,2} , ¹ Chinese Academy of Sciences, China, ² University of Chinese Academy of Sciences, China	[D2.04] On-board contactless OCL geometry measurement method "hybrid sensing method" I. Matsumura*, K. Nezu, H. Susuki, <i>Railway Technical Research Institute, Japan</i>	[E2.04] Wireless sensor nodes for diagnostics and monitoring of freight vehicles S. Cii, E. Sabbioni, D. Tarsitano, G. Tomasini*, <i>Politecnico Di Milano, Italy</i>
12:00-12:15	[A2.05] Flexural performance of slab tracks designed for high speed railway lines A. Güllü ¹ , Y. Durgun ¹ , E. Senol ² , F. Sahin ¹ , A. Nobakhtjoo ¹ , H. Saruhan ¹ , E. Yüksel ¹ , B. Özden* ³ , B. Ölçer ³ , A. Özcan ³ , ¹ Istanbul Technical University Faculty of Civil Engineering, Turkey, ² Yildiz Technical University Faculty of Civil Engineering, Turkey, ³ Railway Construction Syst. Industry and Trade Inc, Turkey	[B2.03] Coupling vibration analysis of flexible carbody and bogie for straddle monorail vehicle J.X. Chen*, J.S. Zhou, D. Gong, W.J. Sun, <i>Tongji University, China</i>	[C2.05] A new method for decreasing pressure transients of high-speed train passing through a tunnel based on cross-section change T. Wang*, F. Wu, M. Yang, P. Ji, <i>Central South University, China</i>	[D2.05] Dropper transient load measurement by non-contact method Z. Jiawei*, C. Weirong, W. Jiqin, X. Kejia, L. Jidong, Z. Yuan, G. Jinfa, X. Jianfeng, <i>Southwest Jiaotong University, China</i>	[E2.05] Optimization of mid-term track maintenance planning model considering ballast deterioration S. Yamamoto* ¹ , S. Motoyoshi ¹ , T. Konishi ¹ , M. Miwa ² , ¹ East Japan Railway Company, Japan, ² Railway Technical Research Institute, Japan
12:15-12:30	[A2.06] Shear behaviour of geosynthetic-reinforced ballast based on large-scale direct shear testing	[B2.04] Is the dimensioning of freight wagon car body resolved? Z. Malkovský, <i>VÚKV</i>	[C2.06] Influence of the flow within a tunnel on the train-tunnel pressure signature	[D2.06] Motion detection based on centroid tracking algorithm with feature tracking for	[E2.06] The impact of extreme weather upon the maintenance and

	S. Kumari*, S.K.K. Hussaini, <i>Indian Institute of Technology Patna, India</i>	a.s., <i>Czech Republic</i>	C. Somaschini*, E. Brambilla, D. Rocchi, P. Schito, G. Tomasini, <i>Politecnico di Milano, Italy</i>	catenary system F. Duan* ¹ , Z. Liu ¹ , A. Rønquist ² , Y. Song ¹ , ¹ <i>Southwest Jiaotong University, China</i> , ² <i>Norwegian University of Science and Technology, Norway</i>	asset management of track: A review of current infrastructure resilience in the UK B.J. Counter* ^{1,2} , J. Sweeney ¹ , ¹ <i>Permanent Way Institution, UK</i> , ² <i>University of Derby, UK</i>
12:30-12:45	[A2.07] Analysis of a new ballastless track for high-speed railways A.F. Esen* ¹ , O. Laghrouche ¹ , P.K. Woodward ^{1,2} , D.P. Connolly ^{1,2} , D. Medina-Pineda ^{1,3} , ¹ <i>Heriot-Watt University, UK</i> , ² <i>University of Leeds, UK</i> , ³ <i>Alstom Transport, France</i>	[B2.05] Analysis of flexible carbody vibration coupled longitudinal suspension S. Yang*, P. Wu, <i>Southwest Jiaotong University, China</i>	[C2.07] Moving model analysis of the slipstream around a high-speed train in a single-track tunnel Y. Guo*, D.L. Guo, G.W. Yang, <i>Institute of Mechanics, Chinese Academy of Sciences, China</i>	[D2.07] Wave propagation analysis in tensioned cable subjected to two moving loads (with application to railway catenary with double pantographs) Y. Song*, Z. Liu, Z. Xu, <i>Southwest Jiaotong University, China</i>	[E2.07] Study of the vibratory behaviour of a High Speed Train bogie using the EMD technique A. Bustos*, H. Rubio, C. Castejon, J.C. Garcia-Prada, <i>Universidad Carlos III de Madrid, Spain</i>
12:45-13:00	[A2.08] Experimental and numerical analysis of railway track components impacting its settlement N. Docquier, <i>Université catholique de Louvain, Belgium</i>	[B2.06] Estimation of forces in the wheel-rail contact using nonlinear Kalman filtering S. Strano*, M. Terzo, <i>University of Naples Federico II, Italy</i>	[C2.08] Aerodynamic force and flow field measurements on two trains in a platoon configuration T. Thieme*, H. Wilhelmi, K. Weinman, A. Henning, C. Wagner, <i>German Aerospace Center, Germany</i>	[D2.08] A new facility for fatigue life estimation of overhead contact lines O. Sunar*, D. Fletcher, A. Beagles, <i>The University of Sheffield, UK</i>	[E2.08] The trouble of moving EMU detection based on deep convolutional neural network Z.X. Hu, Y.M. Hu*, B. Wu, <i>Huazhong University of Science and Technology, China</i>
13:00-13:15					[E2.09] Railway rolling stock fleet predictive maintenance data analytics B.M. Alkali, <i>Glasgow Caledonian University, UK</i>
13:00-14:00	Lunch Room: Noray Restaurant				

14:00-16:00	Session A3: SS08 - Geotechnical Aspects in Rail-Track Performance	Session B3: SS26 - Surface Damage & Maintenance of Rails and Wheels & SS12 - Wheel-Rail Contact Tribology	Session C3: SS05 - Maglev Systems - Modelling and Control	Session D3: SS07 - Pantograph-Catenary Interaction	Session E3: R03 - Energy Efficiency and Storage in Railway Operations
Session Chair	António G. Correia Yoshitsugu Momoya	Klaus Six Luis Baeza	Werner Schiehlen Reinhold Meisinger	Alan Facchinetti Anders Rønnquist	Luca Pugi Johannes Pagenkopf
Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
14:00-14:15	<p>[A3.01] Calibration of slab track models with experimental tests data for railway dynamic applications D. Thölken¹, J. Pombo^{2,3}, J. Abdalla Filho^{1,4}, O. Laghrouche⁵, P. Woodward⁶, ¹Pontifical Catholic University of Paraná, Brazil, ²University of Huddersfield, UK, ³Instituto Superior Técnico, Universidade de Lisboa, Portugal, ⁴Federal Technological University of Paraná, Brazil, ⁵Heriot-Watt University, UK, ⁶University of Leeds, UK</p>	<p>[B3.01] Rolling contact fatigue assessment of rail materials by combining full-scale experiments with model predictions K. Six^{*1}, F. Kupelwieser¹, G. Trummer¹, C. Marte¹, S. Scheriau², P. Dietmaier³, ¹Virtual Vehicle Research Center, Austria, ²voestalpine Schiene GmbH, Austria, ³Graz University of Technology, Austria</p>	<p>[C3.01] Review on maglev vehicle development in germany and the realization in china W. Schiehlen¹, R. Meisinger^{*2}, ¹University of Stuttgart, Germany, ²TH Nuernberg G.S.Ohm, Germany</p>	<p>[D3.01] Experimental investigation of aerodynamic forces due to wind loading on a railway contact wire S. Hayes[*], D. Fletcher, A. Beagles, University of Sheffield, UK</p>	<p>[E3.01] Analysis of German diesel operated regional railway lines' patterns with regard to the application of battery and fuel cell electric trains J. Pagenkopf[*], M. Böhm, J.L. Haas, H. Friedrich, German Aerospace Center, Germany</p>
14:15-14:30	<p>[A3.02] Geosynthetics in railway constructions - groundwater protection M. Hempel, NAUE GmbH & Co. KG, Germany</p>	<p>[B3.02] How to distinguish between fatigue and overload fractures in broken rails D. Firrao[*], R. Doglione, P. Matteis, R. Sesana, Politecnico di Torino, Italy</p>	<p>[C3.02] Stability analysis of EMS maglev vehicle with delayed position feedback control H. Wu^{*1,2}, X.H. Zeng¹, ², ¹Chinese Academy of Sciences, China, ²University of Chinese Academy of Sciences, China</p>	<p>[D3.02] Catenary feature detection based on fiber bragg grating sensor system M.Y. Tan[*], J.W. Wang, D. Zou, N. Zhou, R.P. Li, W.H. Zhang, Southwest Jiaotong University, China</p>	<p>[E3.02] Regenerative braking: An innovative approach for high-speed applications A. Frilli, E. Meli, A. Rindi, B. Romani[*], University of Florence, Italy</p>

14:30-14:45	<p>[A3.03] Evaluating and quantifying the scenario of railway track flooding caused by trunk water main burst S. Faramehr*, T. Fujiyama, <i>University College London, UK</i></p>	<p>[B3.03] Head repair technique using alumino-thermic welding for JIS rail H.I. Ito, <i>Railway Technical Reserch Institute, Japan</i></p>	<p>[C3.03] Research on a combined speed and position detection based on steel sleepers of medium and low speed Maglev train S. Huang*^{1,2}, K. Huang^{1,2}, L. Chen³, ¹Signal & Communication Research Institute of China Academy of Railway Science, China, ²National Railway Intelligent Transportation and Engineering Center, China, ³Birmingham Centre for Railway Research and Education, UK</p>	<p>[D3.03] Study on the influence of rail/wheel excitation on current collection of pantograph-catenary system Y.M. Yao*, D. Zou, H. Zou, J.W. Wang, N. Zhou, W.H. Zhang, <i>Southwest Jiaotong Universit, China</i></p>	<p>[E3.03] Measurement and post-processing concept to estimate the energy recovered through regenerative braking in a light rail system E.E. Roussineau*, P. Otto, P. Gratzfeld, <i>Karlsruhe Institute of Technology, Germany</i></p>
14:45-15:00	<p>[A3.04] Rapid assessment of drainage requirements for railway track S. Zeraati Rezaei*¹, G. Ghataora¹, M. Burrow¹, S. Raj², ¹University of Birmingham, UK, ²Network Rail, UK</p>	<p>[B3.04] Laser application layers to minimize wear on the switch frog point and in the transition area in welded rail joints A. Trausmuth*, R. Schmid, S. Schamberger, M. Rodriguez Ripoll, E. Badisch, <i>AC2T research GmbH, Austria</i></p>	<p>[C3.04] Maglev vehicles on elastic guideways with model order reduction W. Schiehlen, <i>University of Stuttgart, Germany</i></p>	<p>[D3.04] Criteria of concrete pole replacement for electric railway M. Tsunemoto, M. Shimizu, Y. Kondo*, T. Kudo, H. Ueda, T. Iijima, <i>Railway Technical Research Institute, Japan</i></p>	<p>[E3.04] The usage of a locomotive tractive power in the different operating modes and the efficiency control A. Zarifyan, <i>LLC Intelpro TMH, Russia</i></p>
15:00-15:15	<p>[A3.05] True triaxial testing of railway geogrid behaviour Z. Yu¹, O. Laghrouche¹, D.P. Connolly*², P.K.</p>	<p>[B3.05] On the transversal shear crack role in the formation of typical contact fatigue damages of railway</p>	<p>[C3.05] Ride comfort transfer function for the MAGLEV vehicle Transrapid Q. Zheng¹, F. Dignath*¹,</p>	<p>[D3.05] An experimental investigation of the thermal behaviour of a moving pantograph's strip</p>	<p>[E3.05] Energy harvesting system driven by railway vehicle vertical vibration J.Y. Zuo*, J. Yu, C. Liu,</p>

	Woodward ² , M. Horton ³ , ¹ Heriot Watt University, UK, ² University of Leeds, UK, ³ Tensar International, UK	rails O.P. Datsyshyn*, H.P. Marchenko, A.Y. Glazov, O.A. Kravchuk, Karpenko Physico-Mechanical Institute of National Academy of Sciences of Ukraine, Ukraine	P. Eberhard ² , P. Schmid ² , ¹ Thyssenkrupp Transrapid, Germany, ² University of Stuttgart, Germany	N. Delcey ^{*1} , G. Bucca ³ , P. Baucour ¹ , D. Chamagne ¹ , G. Wimmer ¹ , G. Auditeau ² , O. Bouger ² , T. Bausseron ² , N. Bruyere ² , ¹ FEMTO-ST, France, ² SNCF, France, ³ Politecnico di Milano, Italy	Y.H. Gu, Tongji University, China
15:15-15:30	[A3.06] Experimental investigation of ballasted and slab track systems for high-speed railway T. Marolt Cebašek ^{*1} , A.F. Esen ¹ , P.K. Woodward ² , O. Laghrouche ¹ , D.P. Connolly ² , ¹ Heriot Watt University, UK, ² University of Leeds, UK	[B3.06] Influence of wheel profile condition on wheel-rail contact loading and vehicle dynamics - a stochastic approach B. Lubber ^{*1} , G. Müller ¹ , F. Sorribes Palmer ¹ , L. Pietsch ² , K. Six ¹ , ¹ Virtual Vehicle Research Center, Austria, ² PJ Messtechnik GmbH, Austria	[C3.06] Fast computable model of the levitation and guidance control for multibody simulation of the Transrapid MAGLEV vehicle F. Dignath ¹ , Q. Zheng ¹ , P. Schmitz ¹ , X. Liang ² , H. Jin ² , B. Kurzeck ^{*3} , M. Ronde ³ , ¹ Thyssenkrupp Transrapid, Germany, ² CRRC Sifang, China, ³ PROSE München, Germany	[D3.06] Effect of pantograph conductor height mutation to contact force Z. Huang [*] , D.L. Song, G.M. Mei, C. Yu, Southwest Jiaotong University, China	[E3.06] The assessment of the possibility of reducing the fuel consumption by the SM42 locomotive used at track works M. Andrzejewski ^{*1} , P. Daszkiewicz ¹ , J. Merkisz ² , H. Stawecka ¹ , ¹ Rail Vehicles Institute "TABOR", Poland, ² Poznan University of Technology, Poland
15:30-15:45	[A3.07] Investigation of ground and subgrade conditions in the soil structure section of the Tokaido Shinkansen Y. Kawasaki ^{*1} , T. Uematsu ¹ , S. Kato ² , K. Hayano ³ , ¹ Central Japan Railway Company, Japan, ² JR Central Consultants Company, Japan, ³ Yokohama National University, Japan	[B3.07] Influence of the third body on the wheel and rail damage G. Tumanishvili*, T. Natriashvili, T. Nadiradze, I. Tumanishvili, O. Gelashvili, Institute of Machine Mechanics, Georgia	[C3.07] Dynamic responses of non-linear air spring of high-speed maglev vehicle on curving track Y.K. Luo*, C.F. Zhao, Y. F., D.G. Liu, Southwest Jiaotong University, China	[D3.07] Self-compensated contact suspension for high-speed traffic V. Sychenko ¹ , V. Kuznetsov ¹ , M. Pavlichenko ^{*2} , I. Vasil'yev ² , ¹ Dnipropetr ovsk National University of Railway Transport, Ukraine, ² Ural State University of Railway Transport, Russia	[E3.07] A passenger-oriented framework for supporting energy-saving strategies in the case of rail/metro systems L. D'Acerno ^{*1} , M. Botte ¹ , M. Gallo ² , ¹ Federico II University of Naples, Italy, ² University of Sannio, Italy

15:45-16:00		[B3.08] Improved tribology measurements for wheel-rail interface S.A. Khan*, J. Lundberg, <i>Lulea University of Technology, Sweden</i>	[C3.08] Modelling and control system design of the Shanghai maglev vehicle R. Meisinger* ¹ , G. Shen ² , G. Shu ³ , <i>¹TH Nuernberg, Germany, ²Tongji University Shanghai, China, ³Shanghai Institute of Technology, China</i>	[D3.08] Study on metro pantograph lower arm cracks Y. Zhong*, F. Han, J-Q. Wu, J-F. Guan, <i>Southwest Jiaotong University, China</i>	[E3.08] Distributed remote measurement system for rail track vibration energy harvester J.Y. Zuo*, F. Han, C. Liu, <i>Tongji University, China</i>
16:00-16:15		[B3.09] Thermo-mechanical analysis of railway wheel due to tread braking S. Pradhan, B. Samanta, A. Samantaray, V. Racherla*, <i>Indian Institute of Technology Kharagpur, India</i>			
16:00-16:30	Coffee Break / Refreshments Room: Hall Auditorium & Atrium				
16:30-18:00	Session A4: SS14 - Trackbed Design and Maintenance	Session B4: SS16 - Light Railways and Tramway Systems	Session C4: R06 - Traction, Braking and Transmission Systems	Session D4: SS10 - Railway Electric Components - Diagnostics, Monitoring & Modelling	Session E4: R03 - Energy Efficiency and Storage in Railway Operations
Session Chair	<i>Guoqing Jing Mingjing Fang</i>	<i>Andrea Bracciali Yohei Michitsuji</i>	<i>Egidio Di Gialleonardo Christoph Schwarz</i>	<i>Sami Barmada Mauro Tucci</i>	<i>Luca Pugi Johannes Pagenkopf</i>
Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
16:30-16:45	[A4.01] A simple analytical model for vertical stress attenuation of ballastless trackbed in high-speed railway Y. Michitsuji ¹ , K. Mizuno* ¹ , Y. Suda ² , S. Lin ² , S. Makishima ³ , <i>¹Ibaraki</i>	[B4.01] Running performance of EEF bogie with inclined wheel axle Y. Michitsuji ¹ , K. Mizuno* ¹ , Y. Suda ² , S. Lin ² , S. Makishima ³ , <i>¹Ibaraki</i>	[C4.01] Development of SiC applied traction system for shinkansen high-speed train H. Kato*, K. Sato, T. Fukushima, <i>Central Japan Railway</i>	[D4.01] Development of detecting methods in case of a high-voltage circuit ground-fault of rolling stock S. Sato*, N. Shiraki, Y. Chiba, T. Yamamoto,	[E4.01] Evaluation of using battery and supercapacitor in an HESS for an IPEMU regarding weight and volume D. Servatian*, C.

	<i>of Technology, China</i>	<i>University, Japan, ²The University of Tokyo, Japan, ³Toyo Denki Seizo K.K., Japan</i>	<i>Company, Japan</i>	M. Sugaya, K. Kikkawa, A. Kozuka, H. Sasamoto, H. Sato, <i>The Institute of Electrical Engineers of Japan, Japan</i>	Roberts, S. Hillmansen, <i>University of Birmingham, UK</i>
16:45-17:00	[A4.02] Optimal distance between sleepers, a numerical analysis R. Sañudo, M. Cerrada, J. Sainz-Aja*, I. Carrascal, J.A. Casado, S. Diego, <i>Universidad de Cantabria, Spain</i>	[B4.02] A decision making "tool" for the applicability verification of tramway projects M. Chatziparaskeva*, C. Pyrgidis, <i>Aristotle University of Thessaloniki, Greece</i>	[C4.02] Application of finite element method based on MATLAB to the locomotive gear rotor system J.Y. Li*, W.H. Zhang, <i>Southwest Jiaotong University, China</i>	[D4.02] Application of wireless power transfer for railway L. Pugi*, A. Reatti, F. Corti, <i>University of Florence, Italy</i>	[E4.02] Sub-optimal non-linear optimization of trajectory planning for the Next Generation Train (NGT) A. Iraklis, H. Dittus, T. Schirmer*, I. Windemut, J. Winter, <i>German Aerospace Center (DLR), Germany</i>
17:00-17:15	[A4.03] Lateral resistance of ladder sleeper and contribution of bottom crib and end W.L. Jia* ¹ , J.X. Chang ¹ , J.X. Wang ² , G.Q. Jing ¹ , <i>¹Beijing Jiaotong University, China, ²Jiangsu University, China</i>	[B4.03] Study on traction control of bogie applying independently rotating wheels to aim performance improvement for running in sharp curve S. Lin* ¹ , S. Kuniyuki ¹ , Y. Ezaki ^{1,2} , Y. Wang ¹ , Y. Suda ¹ , <i>¹The University of Tokyo, Japan, ²Mitsubishi Electric Corporation, Japan</i>	[C4.03] 3D numerical simulation of heat transfer in brake discs of trains P. Ji ^{1,2} , F. Wu* ^{1,2} , G.L. Zhang ^{1,2} , <i>¹Central South University, China, ²Ministry of Education, China</i>	[D4.03] Modelled, simulation and design of collecting grid of stray currents in slab track in DC electrified railway systems J. Coves* ¹ , F. José Sánchez Aguilar ¹ , J. Rull ² , <i>¹IDOM, Spain, ²UPC, Spain</i>	[E4.03] Potencial of energy efficiency operational planning actions in reducing railway fuel consumption E. Cabral ^{1,3} , M. Cruz* ² , R. Pirola ¹ , H. Andrade ¹ , B. Muniz ¹ , F. Machado ¹ , L. Freitas ³ , <i>¹Vale S.A, Brazil, ²Federal University of Espirito Santo, Brazil, ³Centro Leste Faculty, Brazil</i>
17:15-17:30	[A4.04] Dynamic response of railway track-bed under various water-induced softening conditions V.O. Ojekunle* ^{1,2} , R.P. Chen ¹ , H.L. Wang ^{1,3} , <i>¹Hunan University, China, ²University of</i>	[B4.04] Evaluation of resilient wheel for independently rotating wheels with hub-motor system Y. Ezaki* ^{1,2} , S. Kuniyuki ² , S. Lin ² , Y. Suda ² , <i>¹Mitsubishi</i>	[C4.04] Thermal-Mechanical coupled analysis of train brake disc by friction method J.Y. Zuo*, Y.H. Gu, J. Yu, C. Liu, <i>Tongji University, China</i>	[D4.04] Predictive maintenance of railway traction systems based on temperature monitoring S. Barmada*, E. Crisostomi, M. Tucci, <i>University of Pisa,</i>	[E4.04] Research of regularities the power consumption along the train trip trajectory V. Gopkalo*, B. Davydov, <i>Far Eastern State Transport University, Russia</i>

	<i>Lagos, Nigeria, ³University of Macau, Macao</i>	<i>Electric Corporation, Japan, ²The University of Tokyo, Japan</i>		<i>Italy</i>	
17:30-17:45	<p>[A4.05] Finite element analysis of thermal insulation effect based on a new railway substructure H. Chen, M. Fang*, G. Liu, <i>Wuhan University of Technology, China</i></p>	<p>[B4.05] Analysis on guidance performance of independently rotating wheels with electrical differential control method H-T. Li*, M-R. Chi, S-L. Liang, X-W. Wu, <i>Southwest Jiaotong University, China</i></p>	<p>[C4.05] Thermal crack propagation properties for railway brake disk under various braking conditions Y. Sakayama*, T. Kato, M. Miyahara, <i>Nippon Steel & Sumitomo Metal Corporation, Japan</i></p>		<p>[E4.05] New concept of DC traction network reinforcement V. Sychenko*¹, V. Kuznetsov¹, N. Pulin², Y. Kosarev¹, P. Hubsykyi¹, V. Kuznetsov³, ¹<i>Dnipropetrovsk National University of Railway Transport, Ukraine,</i> ²<i>Lviv Branch Company of PSC Ukrzaliznycia, Ukraine,</i> ³<i>National Metallurgical Academy, Ukraine</i></p>
17:45-18:00					<p>[E4.06] Effects of track gradient related parameters on energy consumption and capacity B.F. Mustad*¹, E. Kassa¹, A.C.T. Handstanger², ¹<i>Norwegian University of Science and Technology (NTNU), Norway,</i> ²<i>Infraplan AS, Norway</i></p>
19:00-22:30	Conference Dinner – Can Laury Restaurant (5 minute walk – delegates to meet in the hotel lobby at 18.45)				

Wednesday 5 September 2018

08:30-10:30	Session A5: SS18 - Ballast Track - Precise Characterization and Wear Modelling	Session B5: SS25 - Wheel-Rail Interaction Problems, Simulation, Monitoring and Validation	Session C5: SS01 - Accident Prevention and Safety Technologies	Session D5: SS03 - Dynamics of Railway Bridges	Session E5: R05 - Rail Transport Planning & Operations Management
Session Chair	Jean-Francois Ferellec Geert Degrande	Makoto Ishida Stefano Bruni	Akira Matsumoto Sakdirat Kaewunruen	Rui Calçada Raid Karoumi	Rattapoomh Parichatprecha Leonardo M. Vianna
Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
08:30-08:45	<p>[A5.01] Ballast behaviour under high-speed passenger and freight lines T. Stark*¹, S. Wilk¹, T. Sussmann², H. Thompson³, ¹University of Illinois at Urbana-Champaign, USA, ²Volpe Center, USA, ³Federal Railroad Administration, USA</p>	<p>[B5.01] Computational method for dynamic interaction of high speed train and railway structure after derailment during an earthquake M. Tanabe*¹, K. Goto², T. Watanabe², M. Sogabe², Y. Tanabe³, ¹Kanagawa Institute of Technology, Japan, ²Railway Technical Research Institute, Japan, ³Laboratory for Computational Mechanics Inc., Japan</p>	<p>[SL.04] Investigation of derailment accidents on Shinkansen line due to great earthquakes by Japan transport safety board H. Ishida*¹, Y. Muro², K. Iida², ¹Japan Transport Safety Board, Japan, ²Railway Technical Research Institute, Japan</p>	<p>[D5.01] Hell bridge test arena - improve monitoring and damage detection in sensor assisted inspections of steel bridges A. Rønquist*, G.T. Frøseth, B.T. Svendsen, Norwegian University of Science and Technology, NTNU, Norway</p>	<p>[E5.01] Optimization of railway maintenance using a panel of indicators productivity L.M. Vianna*^{1,2}, R. Troian¹, L.D. Schneider¹, G.M.A. Oliveira¹, ¹MRS Logística S.A., Brazil, ²Fundação Educacional São José, Brazil</p>
08:45-09:00	<p>[A5.02] Evaluation of ballast grain abrasion by rotating drum test and DEM simulation A. Kono*¹, T. Matsushima², N. Ito², ¹Railway Technical Research Institute, Japan, ²University of Tsukuba, Japan</p>	<p>[B5.02] Development and validation of a wear model by using innovative non-contact measuring instruments E. Butini*¹, L. Marini¹, E. Meli¹, A. Rindi¹, S. Logozzo², M.C. Valigi², ¹Università di Firenze, Italy, ²Università</p>		<p>[D5.02] Limits of the HSLM-A (EN 1991/2) load model at lower wavelengths and theoretical bases for the determination of critical trains and bridges V. Martí, P. Museros*, Universitat Politècnica de València, Spain</p>	<p>[E5.02] A proposal to define high speed railway tracks and services C. Pyrgidis, Aristotle University of Thessaloniki, Greece</p>

		<i>di Perugia, Italy</i>			
09:00-09:15	<p>[A5.03] Determination of the saturated surface dry condition of recycled concrete fines J. Kim*, N.H. Yi, Y.S. Kang, D.S. Kim, <i>Korea Railroad Research Institute, Republic of Korea</i></p>	<p>[B5.03] The research on the key conditions of polygonal wear of high-speed train's wheel Y. Wu*, W. Cai, S. Zhong, X. Xiao, S. Liang, X. Jin, <i>Southwest Jiaotong University, China</i></p>	<p>[C5.01] Rail vehicle derailment- a systematic approach to investigation and the identification of safety learning N.J. Shaw, <i>Rail Accident Investigation Branch, UK</i></p>	<p>[D5.03] Drive-by monitoring of railway bridges by direct integration E.J. O'Brien, Y. Ren*, J. Keenahan, <i>University College Dublin, Ireland</i></p>	<p>[E5.03] Benchmarking operation readiness of Hokuriku Shinkansen by using ARENA simulation method P. Rungskunroch*, S. Kaewunruen, <i>University of Birmingham, UK</i></p>
09:15-09:30	<p>[A5.04] Predicting the vertical track quality evolution by multibody simulations considering the ballast settlement B. Rodriguez-Arana*^{1,2}, B. Blanco^{1,2}, U. Alvarado^{1,2}, ¹Ceit-IK4, <i>Spain</i>, ²Universidad de Navarra, <i>Spain</i></p>	<p>[B5.04] Mechanisms, influence and control of high order wheel polygonization - field test results and analysis of CRH X. Xiao*, J. Zhang, J. Han, <i>Southwest Jiaotong University, China</i></p>	<p>[C5.02] 3 plus 1 method of testing of safety against derailment J. Capek, <i>VÚKV a.s., Czech Republic</i></p>	<p>[D5.04] On the prediction of maximum resonance and cancellation of resonance in orthotropic plates: Application to railway bridges P. Galvin¹, M. Martinez-Rodrigo*², A. Romero¹, E. Moliner², ¹Universidad de Sevilla, <i>Spain</i>, ²Universitat Jaume I, <i>Spain</i></p>	<p>[E5.04] Micro-macro railway traffic management A. Marín*², E. Codina¹, L. Jimenez², M.A. Ruiz², ¹Barcelona TECH-UPC, <i>Spain</i>, ²Polytechnic University of Madrid, <i>Spain</i></p>
09:30-09:45	<p>[A5.05] Infrared thermographic investigation of the ballast on the light rail in Croatia V. Grgic, <i>University of Zagreb, Croatia</i></p>	<p>[B5.05] An investigation on the causes of premature wear of an urban railway transportation system J.L. González*¹, D.I. Rivas¹, G. González², ¹Instituto Politécnico Nacional, <i>Mexico</i>, ²Independent Railway Consultant, <i>Mexico</i></p>	<p>[C5.03] Safety issues for the shinkansen in case of major earthquake < development and installation of rail rollover prevention device of preventing extreme deviation for track > M. Itakura*, D. Kouzu, T. Konishi, <i>JR East, Japan</i></p>	<p>[D5.05] Assessment of the train running safety on the new high-speed railway bridge across the Volga River P.A. Montenegro*, R. Calçada, <i>University of Porto, Portugal</i></p>	<p>[E5.05] Energy saving potentials of railways instead of roadways: Mexico case J.A.R.N. Romero¹, A.A.L.G. Lozano-Guzman*², F.O. Otreмба³, ¹Querretar o Auntonomous University, <i>Mexico</i>, ²CICATA (IPN) Queretaro, <i>Mexico</i>, ³BAM, <i>Germany</i></p>

09:45-10:00	<p>[A5.06] Advances in the modelling of railway ballast using the discrete element method J. Irazábal*¹, F. Salazar¹, E. Oñate^{1,2}, ¹Centre Internacional de Mètodes Numèrics en Enginyeria (CIMNE), Spain, ²Universitat Politècnica de Catalunya (UPC), Spain</p>	<p>[B5.06] Design of a six degrees of freedom rail-wheel contact simulator V. Racherla*, K. Prajapati, <i>Indian Institute of Technology Kharagpur, India</i></p>	<p>[C5.04] Predominant factor of seismic vehicle running safety on structures K. Goto*¹, M. Sogabe¹, M. Tokunaga¹, H. Ito², K. Kobayashi², F. Uehan¹, T. Watanabe¹, ¹Railway Technical Research Institute, Japan, ²East Japan Railway Company, Japan</p>	<p>[D5.06] Design of a bridge across The Volga River for the future high speed railway line Moscow - Kazan in Russia A.A. Bolkovoy, <i>OJSC Institute Giprostroimost, Russia</i></p>	<p>[E5.06] Development and verification of station congestion visualization tool utilizing existing data T. Sahara*, S. Sakairi, <i>East Japan Railway Company, Japan</i></p>
10:00-10:15	<p>[A5.07] Ballast degradation: Modelling using moving load, steady-state algorithm and fatigue T. Badinier*^{1,2}, S. Maiolino¹, H. Maitournam², ¹Cerema, France, ²IMSIA, France</p>	<p>[B5.07] Adhesion enhancement mechanisms and effects of sanding in wheel-rail contact G. Hao*^{1,2}, K. Babilon², R. Pfaff², A. Reich³, ¹Southwest Jiaotong University, China, ²FH Aachen University of Applied Sciences, Germany, ³Nowe GmbH, Germany</p>	<p>[C5.05] Slipstream effects of freight trains - an investigation into an accident involving a wheelchair user at Twyford railway station, UK S.R. Lomax, <i>Rail Accident Investigation Branch, UK</i></p>	<p>[D5.07] Bridge-train dynamic interaction analysis for possibility of track speed upcase study of Poramintra Bridge, Thailand S. Suthasupradit*, R. Parichartpreecha, P. Paoleng, P. Kunadhamraks, <i>Naresuan University, Thailand</i></p>	<p>[E5.07] Capacity methodology suggestion P. Šrámek*, T. Molková, <i>University of Pardubice, Czech Republic</i></p>
10:15-10:30	<p>[A5.08] Modelling ballast wear: From DEM simulations to shearing at the contact scale I. Deiros Quintanilla*^{1,3}, G. Combe^{1,2}, F. Emeriault^{1,2}, C. Voivret³, J.F. Ferrellec³, ¹Université Grenoble Alpes, France, ²CNRS, France, ³SNCF Réseau, France</p>	<p>[B5.08] REPOINT- designing a radically new switch machine S. Dutta¹, T. Harrison¹, M. Sarmiento-Carnevali¹, O. Olaby*¹, S.D. Bemment¹, C.P. Ward¹, A. Chalisey², R. Dixon¹, P. Kaijuka¹, S. Henson¹, ¹Loughborough University, UK, ²RSSB, UK</p>	<p>[C5.06] Pedestrian sight distance needs at railroad crossings with considering characteristics of trains and pedestrians S. Easa², E. Dabbour*¹, A. Gruchalla-Wesierski², X. Qu³, ¹Abu Dhabi University, United Arab Emirates, ²Ryerson University, Canada,</p>	<p>[D5.08] Analysis of settlement and deformation of the caisson foundation of the main pier of the Hu-Tong Yangtze river bridge F. Yu*, S.X. Chen, J. Li, Z.J. Dai, Z.C. Chi, <i>Chinese Academy of Sciences, China</i></p>	<p>[E5.08] Analysis of spatio-temporal profiling of public transport delays based on large scale GPS data I. Gisterek*, P. Szymaski, <i>Wroclaw University of Science and Technology, Poland</i></p>

			³ University of Technology Sydney, Australia		
10:30-10:45	<p>[A5.09] Long-term monitoring of fouled ballast sites T.D. Stark*¹, R. Banister², T.R. Sussmann³, H.B. Thompson⁴, Y. Ren¹, R. Bruzek⁵, ¹Illinois at Urbana-Champaign, USA, ²BNSF Railway, USA, ³Volpe Center, USA, ⁴Federal Railroad Administration, USA, ⁵EnSCO, Inc., USA</p>		<p>[C5.07] Safety climate in the UK railway industry: A leading indicator of safety performance? Analysis of the impact on accident experience, safety compliance, consideration of future safety consequences, and trust in organizational safety systems J.I. Morgan*¹, K. Rajkiran², M. Curcuruto¹, M.A. Griffin¹, ¹Leeds Beckett University, UK, ²University of Western Australia, Australia</p>		
10:30-11:00	Coffee Break / Refreshments Room: Hall Auditorium & Atrium				
11:00-13:00	Session A6: SS29 - Railway Track Modelling - Combination Between Technical & Science	Session B6 SS25 - Wheel-Rail Interaction Problems, Simulation, Monitoring and Validation	Session C6: SS01 - Accident Prevention and Safety Technologies	Session D6: SS03 - Dynamics of Railway Bridges	Session E6: R05 - Rail Transport Planning & Operations Management
Session Chair	Gilles Saussine Jean-Francois Ferellec	Makoto Ishida Stefano Bruni	Akira Matsumoto Hideo Nakamura	Rui Calçada Raid Karoumi	Rattapoohm Parichatprecha Leonardo M. Vianna
Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
11:00-11:15	<p>[A6.01] Optimisation of ballasted tracks maintenance using DEM J.F. Ferellec*, V.H. Nhu, R. Perales, M. Wone, G. Saussine, SNCF RESEAU, France</p>	<p>[B6.01] Fuzzy logic approach for the improvement of the estimation of wheel-rail contact forces E. Di Gialleonardo*, S. Bionda, G. Cazzulani,</p>	<p>[C6.01] Safety assessment of closed-loop level crossing control systems by means of Systems-Theoretic Accident Model and Processes (STAMP)</p>	<p>[D6.01] Evaluation of PC girders deformation in railways with considering externally supplied water K. Watanabe*, Y. Ohno, Railway</p>	<p>[E6.01] Development of thailand rail standardization plan R. Parichatprecha*¹, S. Suthasupradit¹, J. Choi^{1,2}, P. Kunadhamraks¹</p>

		F. Braghin, <i>Politecnico di Milano, Italy</i>	T. Takata* ¹ , A. Asano ¹ , S. Takahashi ² , H. Nakamura ² , ¹ <i>Kyosan Electric Mfg.Co.,Ltd, Japan</i> , ² <i>Nihon University, Japan</i>	<i>Technical Research Institute, Japan</i>	³ , ¹ <i>Naresuan University, Thailand</i> , ² <i>Korea Railroad Research Institute, Republic of Korea</i> , ³ <i>Ministry of Transport, Thailand</i>
11:15-11:30	[A6.02] Construction of a large-scale ballasted track analytical model by elastic discrete element method (QDEM) A. Aikawa* ¹ , D. Nishiura ² , S. Kaewunruen ³ , H. Sakaguchi ² , ¹ <i>Railway Technical Research Institute, Japan</i> , ² <i>Japan Agency for Marine-Earth Science and Technology, Japan</i> , ³ <i>University of Birmingham, UK</i>	[B6.02] Development of a new wheel-rail contact model for multibody simulations F. Marques ¹ , H. Magalhães* ² , J. Pombo ^{2,3} , P. Flores ¹ , J. Ambrósio ² , ¹ <i>Universidade de do Minho, Portugal</i> , ² <i>Instituto Superior Técnico, Portugal</i> , ³ <i>University of Huddersfield, UK</i>	[C6.02] Multimodal cooperative safety services: Location-based alert system at level crossings G. Aifadopoulou ¹ , J. Grau* ¹ , A. Kortsari ¹ , P. Tzenos ¹ , N. Sourtzinou ² , A. Dalkalitis ² , ¹ <i>Centre for Research and Technology Hellas - Hellenic Institute for Transport, Greece</i> , ² <i>TRAI NOSE, Greece</i>	[D6.02] Study on mechanical parameters of disturbed sand layer in caisson foundation of Shanghai-Nantong Combined Highway and Railway Bridge H.M. Luo* ¹ , S.X. Chen ¹ , L.D. Bai ² , Y. yan ² , ¹ <i>Chinese Academy of Science, China</i> , ² <i>Guizhou Expressway Group Co.,Ltd, China</i>	[E6.02] Purchasing power reflecting movement data T. Kanzaki, S. Sakairi, T. Kobayashi*, <i>East Japan Railway Co., Japan</i>
11:30-11:45	[A6.03] Advanced particle-particle contact modelling in DEM simulations of railway ballast K. Six*, B. Suhr, <i>Virtual Vehicle Research Center, Austria</i>	[B6.03] An innovative local contact model under degraded adhesion conditions for railway applications M. Meacci*, E. Boccini, E. Butini, L. Marini, E. Meli, A. Rindi, Z. Shi, <i>University of Florence, Italy</i>	[C6.03] For improving safety at level crossings E. Bakaba*, J. Ortlepp, <i>German Insurance Association, Germany</i>	[D6.03] Experimental and numerical approaches for calibration of the material parameters used in models of stone masonry railway bridges R. Silva* ¹ , C. Costa ^{2,1} , A. Arêde ¹ , ¹ <i>University of Porto, Portugal</i> , ² <i>Polytechnic Institute of Tomar, Portugal</i>	[E6.03] Public transportation questionnaire for driverless train operation M. Oyado*, Y. Watanabe, M. Muto, <i>Railway Technical Research Institute, Japan</i>
11:45-12:00	[A6.04] Numerical study of ballast-flying process caused by accreting snow/ice on high-speed trains by using the	[B6.04] Development of an innovative tool for wheel and rail wear and rolling contact fatigue evaluation	[C6.04] Dynamic response of high speed train in curve negotiation under crosswind H. Wu ^{1,2} , X.H. Zeng* ¹	[D6.04] On site measurements of the continuously-welded rail on the Chabarovice bridge M. Foglar*, F.	[E6.04] Supporting the strategic management mobilizing the railway transport in disaster

	<p>Discontinuous Deformation Analysis (DDA) D. Ding*¹, A. Ouahsine¹, G.Q. Jing², ¹Université de Technologie de Compiègne, France, ²Beijing Jiaotong University, China</p>	<p>E. Butini*, L. Marini, M. Meacci, E. Meli, A. Rindi, <i>Università di Firenze, Italy</i></p>	<p>², ¹Chinese Academy of Sciences, China, ²University of Chinese Academy of Sciences, China</p>	<p>Blaha, <i>Czech Technical University in Prague, Czech Republic</i></p>	<p>response S. Kizhikyevev, A. Wangai*, J. Rohacs, D. Rohacs, <i>Budapest University of Technology and Economics, Hungary</i></p>
12:00-12:15	<p>[A6.05] Ballast creep simulations by discrete elements method M. Woné*, J.F. Ferellec, G. Saussine, <i>SNCF Réseau, France</i></p>	<p>[B6.05] Estimation of friction coefficient between rail and wheel from measured values of PQ wheelset using kalman filter K. Murata*, Y. Takemura, T. Kaizuka, M. Suzuki, T. Miyamoto, K. Nakano, <i>The University of Tokyo, Japan</i></p>	<p>[C6.05] Development of train operation control method against wind gusts using Doppler radar H. Suzuki*¹, K. Kusunoki², C. Fujiwara¹, H. Inoue², ¹East Japan Railway Company, Japan, ²Meteorological Research Institute, Japan</p>	<p>[D6.05] Train-track-bridge interaction for non-ballasted railway bridges on high-speed lines T. Arvidsson, A. Andersson*, R. Karoumi, <i>Royal Institute of Technology (KTH), Sweden</i></p>	<p>[E6.05] A weibit-based p-hub approach for the park-and-ride facility location problem S. Kitthamkesorn*¹, S. Jaita¹, V. Seangawut², ¹Chiang Mai University, Thailand, ²Khon Kaen University, Thailand</p>
12:15-12:30	<p>[A6.06] Analytical and numerical studies of the track steady-state vibration under a moving train Y.Z. Zhang¹, ¹Chinese Academy of Sciences, China, ²University of Chinese Academy of Sciences, China</p>	<p>[B6.06] A novel procedure to measure wheel-rail contact forces in an instrumented scale railway vehicle P. Urda*¹, S. Muñoz¹, J.F. Aceituno², J.L. Escalona^{3,1}, ¹University of Seville, Spain, ²University of Jaen, Spain, ³University of Aarhus, Denmark</p>	<p>[C6.06] Approaches of a monitoring system to detect ice accumulations on trains M. Ostermann*¹, T. Maly¹, F. Michelberger², ¹Vienna University of Technology, Austria, ²University of Applied Sciences St. Poelten, Austria</p>	<p>[D6.06] Numerical analysis of beam rail bridges - the impact factors in normal stress M. Podworna, <i>Wroclaw University of Science and Technology, Poland</i></p>	<p>[E6.06] Real-time speed profile optimisation for automatic train operation H. Ye*, R. Liu, <i>University of Leeds, UK</i></p>
12:30-12:45	<p>[A6.07] Identification of a randomly-fluctuating continuous model of the ballast based on track measurements at the</p>	<p>[B6.07] Railway vehicle dynamics including the interaction with a flexible track P. Antunes^{1,2}, J. Costa¹,</p>	<p>[C6.07] Harmonic resonance identification and prediction of electrified railway system based on impedance analysis</p>	<p>[D6.07] Advances in the simulation of the dynamic behaviour of short simply-supported girder bridges:</p>	<p>[E6.07] Will the current public transport network in Birmingham support passenger disembarking HS2?</p>

	<p>pass-by of high-speed trains H. Pinault*^{1,2}, L. de Abreu Corrêa¹, R. Cotterau¹, B. Faure², ¹MSSMat Laboratory, France, ²SNCF Innovation & Research, France</p>	<p>J. Ambrosio*¹, H. Magalhaes¹, J. Pombo^{1,2}, ¹University of Lisbon, Portugal, ²University of Huddersfield, UK</p>	<p>S. Liu*, F. Lin, Z. Yang, M. Mu, R. Zhang, <i>Beijing Jiaotong University, China</i></p>	<p>Transverse behaviour and comparison with experimental measurements E. Moliner*¹, M.D. Martínez-Rodrigo¹, A. Romero², P. Galvín², ¹Universitat Jaume I, Spain, ²Universidad de Sevilla, Spain</p>	<p>S. Kaewunruen, U.R. Silva, P. Rungskunroch*, <i>University of Birmingham, UK</i></p>
12:45-13:00	<p>[A6.08] A novel moving beam element of variable length and its application in long track dynamics C.J. Yang, Y. Xu*, W.H. Zhang, <i>Southwest Jiaotong University, China</i></p>	<p>[B6.08] Periodic short-wave irregularities contribution to wheel-rail interaction T. Staskiewicz, B. Firlik* <i>Poznan University of Technology, Poland</i></p>	<p>[C6.08] Estimation method of friction coefficient between outside wheel flange and rail based on vehicle dynamics simulation Y. Ichiyanaagi*¹, Y. Michitsuji¹, A. Matsumoto², Y. Sato³, H. Ohno³, S. Ogata³, M. Tanimoto⁴, T. Maeda⁴, T. Matsuda⁴, T. Nakai⁵, ¹Ibaraki University, Japan, ²Nihon University, Japan, ³National Traffic Safety & Environment Laboratory, Japan, ⁴Tokyo Metro Co., Ltd., Japan, ⁵Nippon Steel & Sumitomo Metal Corporation, Japan</p>	<p>[D6.08] Methodology for the analysis of vehicle-track-structure dynamic interaction considering non-linear effects L. Ticona Melo³, D. Ribeiro*¹, R. Calçada², T. Bittencourt³, ¹Polytechnic of Porto, Portugal, ²University of Porto, Portugal, ³São Paulo University, Brazil</p>	
13:00-14:00	Lunch Room: Noray Restaurant				
14:00-16:00	Session A7: SS06 - Track Structure and its Components	Session B7: R04 - Modelling and Simulation of Railway Vehicles	Session C7: SS01 - Accident Prevention and Safety Technologies	Session D7: SS03 - Dynamics of Railway Bridges	Session E7: SS17 - Railway Noise and Vibration
Session Chair	Sakdirat Kaewunruen Makoto Ishida	Makoto Tanabe Ingo Kaiser	Hiroaki Ishida Hideo Nakamura	Anders Rønnquist Pedro Museros Romero	Xiaozhen Sheng Georges Kouroussis

Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
14:00-14:15	<p>[A7.01] Re-using “life expired” railway ballast, laboratory testing T.C. Abadi, L.M. Le Pen*, W. Powrie, <i>University of Southampton, UK</i></p>	<p>[B7.01] Assessment of benefits for passive and mechatronic steering systems for 3-axle powered bogies by means of multi-body simulation S. Bruni*¹, E. Di Galleonardo¹, B. Liu¹, M. Pálinkó², J. Muñoz³, ¹<i>Politecnico di Milano, Italy</i>, ²<i>Technische Universitaet Berlin, Germany</i>, ³<i>Stadler Rail Valencia, Spain</i></p>	<p>[C7.01] Algorithm for convolutional fuzzy-neural network for railway station manoeuvres A. Levchenkov*, A. Beinarovica, M. Gorobetz, I. Alps, <i>Riga Technical University, Latvia</i></p>	<p>[D7.01] Assessment of total fatigue life in complex bridge welded connections C.S. Horas, G. Alencar, A.M.P. Jesus, R. Calçada*, <i>University of Porto, Portugal</i></p>	<p>[SL.05] A comparison of the noise and vibration performance of slab and ballasted track designs D.J. Thompson*, X. Zhang, E. Ntotsios, G. Squicciarini, <i>University of Southampton, UK</i></p>
14:15-14:30	<p>[A7.02] Wet/dry influences on dynamic characteristics of railway ballast C. Ngamkhanong*, T. Tao, S. Kaewunruen, C. Baniotopoulos, <i>The University of Birmingham, UK</i></p>	<p>[B7.02] Track damage comparison between conventional and articulated trains operating on a GB railways ‘classic’ mainline route and a high speed route A. Rhodes¹, G. Hunt¹, N. Harwood², N. Kuka*³, L. Baron³, J. Borrell³, ¹<i>Serco Rail Technical Services, UK</i>, ²<i>Alstom Transport UK, UK</i>, ³<i>Alstom, France</i></p>	<p>[C7.02] A research method on train crashworthiness based on a new scaled similitude rule G-J. Gao*¹, Y. Yu¹, W-L. Zhu¹, ¹<i>Key Laboratory of Traffic Safety on Track of Ministry of Education, China</i>, ²<i>National & Local Joint Engineering Research Center of Safety Technology for Rail Vehicle, China</i>, ³<i>School of Traffic & Transportation Engineering, China</i></p>	<p>[D7.02] Relative frequency, a damage sensitive feature for railroad bridges N. Mostafa*, R. Loendersloot, D. Di Maio, T. Tinga, <i>University of Twente, The Netherlands</i></p>	
14:30-14:45	<p>[A7.03] Numerical modelling of an experimental set-up simulating asphalt overlayment tracks</p>	<p>[B7.03] Lateral guidance of independently rotating wheel pairs using feedback linearization</p>	<p>[C7.03] Data-driven prognostics for predicting remaining useful life of IGBT: A</p>	<p>[D7.03] Critical assessment of steel shelter on high speed railway bridges K. Matsuoka*¹, M.</p>	<p>[E7.01] Measurements of railway induced vibrations in a multi-storey building for</p>

	T. Bose*, V. Zania, E. Levenberg, <i>Technical University of Denmark, Denmark</i>	G. Grether*, G. Looye, A. Heckmann, <i>German Aerospace Center (DLR), Germany</i>	review X. Fang ^{1,2} , S. Liu* ¹ , F. Lin ¹ , P. Tricoli ² , Z. Yang ¹ , ¹ Beijing Jiaotong University, China, ² University of Birmingham, UK	Sogabe ¹ , S. Inoue ² , ¹ Railway Technical Research Institute, Japan, ² Japan Railway Construction, Transport and Technology Agency, Japan	model validation M. Papadopoulos, K. Kuo, M. Germonpré, G. Lombaert, G. Degrande*, <i>KU Leuven, Belgium</i>
14:45-15:00	[A7.04] Rail expansion joint behaviour and free length of railway bridges D. Garcia-Sanchez* ¹ , R. Sañudo ² , O.R. Ramos ³ , J.M. Pantaleon ³ , A. Reguero ⁴ , F. Cabrera ⁴ , ¹ Fundacion Tecnalia Research and Innovation, Spain, ² Universidad de Cantabria, Spain, ³ Louis Berger, Spain, ⁴ ADIF, Spain	[B7.04] The influence of passive control devices in railway wheels tangential forces in curves A.P. Trindade*, P.R.G. Kurka, A.A. Santos, T.O. Almeida, <i>University of Campinas, Brazil</i>	[C7.04] Safety analysis of a vehicle running on a broken rail with due consideration on track irregularity Y. Nishinomiya*, H. Kataoka, <i>Railway Technical research Institute, Japan</i>	[D7.04] Fatigue performance assessment of hangers in a rigid tied arch bridge under train loads W. Zhong* ¹ , Y.L. Ding ¹ , Y.S. Song ² , ¹ Southeast university, China, ² Jinling Institute of Technology, China	[E7.02] Using the waveguide boundary element and statistical energy analysis method to determine the sound incident on a train external surface H. Li*, D.J. Thompson, G. Squicciarini, <i>University of Southampton, UK</i>
15:00-15:15	[A7.05] A resetting work of continuous welded rail (CWR) including plural switch and crossings on a very high speed track Y. Hori*, Y. Ando, M. Kashiwagi, <i>East Japan Railway Company, Japan</i>	[B7.05] Effects of the difference in wheel profiles on vehicle dynamics B. Liu*, S. Bruni, <i>Politecnico di Milano, Italy</i>	[C7.05] Analysis of factors affecting train energy absorption based on multibody dynamics H. Zhu*, S. Yao, K. Yan, Z. Li, <i>Central South University, China</i>	[D7.05] Risk assessment over life cycle of a railway bridge J. Fernandes* ¹ , J. Matos ¹ , D. Oliveira ¹ , A. Abel Henriques ² , ¹ University of Minho, Portugal, ² University of Porto, Portugal	[E7.03] An evaluation method of car body hunting J.F. Sun*, M.R. Chi, C.G. Huang, X.S. Jing, <i>Southwest Jiaotong University, China</i>
15:15-15:30	[A7.06] The mechanical behaviour of an insulated rail joint (IRJ) with different installation options J. Yu, J.Y. Shih*, H. Hemida, E. Stewart, K.D.	[B7.06] Powertrain and braking modelling for dynamic analysis of railway vehicles running at variable speed H. Magalhaes* ¹ , J. Costa ¹ , J. Pombo ^{1,2} , J.	[C7.06] A consideration on a practical use of GNSS for a train protection system A. Asano* ¹ , T. Takata ¹ , H. Nakamura ² , ¹ Kyosan Electric Mfg.Co.,Ltd,	[D7.06] Analysis of occurrence factors on the torsion for rigid frame abutment K. Narita*, Y. Nakata, Y. Ono, T. Tadokoro, <i>Railway</i>	[E7.04] 2.5D MFS-FEM model to assess vibrations induced by railway traffic: Verification and performance A. Colaço* ¹ , P. Alves Costa ¹ , P. Amado-

	Dearn, P. Weston, <i>University of Birmingham, UK</i>	Ambrosio ¹ , ¹ <i>University of Lisbon, Portugal,</i> ² <i>University of Huddersfield, UK</i>	Japan, ² <i>Nihon University, Japan</i>	<i>Technical Research Institute, Japan</i>	Mendes ² , R. Calçada ¹ , ¹ <i>University of Porto, Portugal,</i> ² <i>University of Coimbra, Portugal</i>
15:30-15:45	[A7.07] Buckling load analysis in dual gauge tracks I. Villalba Sanchis*, R. Insa Franco, P. Salvador Zuriaga, P. Martínez Fernández, <i>Universitat Politècnica de València, Spain</i>	[B7.07] Vibration response analysis of vehicle system caused by high order wheel polygon X.Y. Qi*, D.L. Song, W.H. Zhang, <i>Southwest Jiaotong University, China</i>	[C7.07] An entropy-based evaluation method for railway track inspection M.H. Osman* ^{1,2} , S. Kaewunruen ¹ , ¹ <i>University of Birmingham, UK,</i> ² <i>Universiti Kebangsaan Malaysia, Malaysia</i>	[D7.07] Modelling of pot bearings for dynamic analysis of railway bridges M. Ülker-Kaustell* ^{1,2} , R. Karoumi ¹ , ¹ <i>Tyréns AB, Sweden,</i> ² <i>KTH Royal Institute of Technology, Sweden</i>	[E7.05] Modelling of a discretely supported track by using a waveguide finite element method X. Zhang* ¹ , Q. Li ² , D. Thompson ¹ , D. Kostovasilis ¹ , M. Toward ¹ , G. Squicciarini ¹ , J. Ryue ³ , ¹ <i>University of Southampton, UK,</i> ² <i>Tongji University, China,</i> ³ <i>University of Ulsan, Republic of Korea</i>
15:45-16:00	[A7.08] Anti-buckling sleeper F. Fernández Hernández, F. Fernández Hernández, A. Zornoza Arnao, F. Ribes-Llario, J. Real Herraiz, D. San Millan Garcia*, <i>ACCISA, Spain</i>	[B7.08] Dynamic performance and degradation law of hydraulic damper based on energy method Z.Y. Hu*, D.L. Song, W.H. Zhang, H.L. Wu, <i>Southwest Jiaotong University, China</i>	[C7.08] Streetcar accidents: Structure of the accident occurrence, affected infrastructure and measures E. Bakaba*, J. Ortlepp, <i>German Insurance Association, Germany</i>	[D7.08] Local dynamic behaviour of a reinforced concrete bridge deck slab under railway traffic J. Malveiro* ¹ , C. Sousa ¹ , D. Ribeiro ² , R. Calçada ¹ , ¹ <i>University of Porto, Portugal,</i> ² <i>Polytechnic of Porto, Portugal</i>	[E7.06] Comparative measurements and calculations of ground vibrations near slab and ballast tracks L. Auersch, <i>Federal Institute of Material Research and Testing, Germany</i>
16:00-16:15					[E7.07] Vibration isolation in high-speed train with low frequency isolators Y. Li, <i>Central South University, China</i>
16:00-16:30	Coffee Break / Refreshments Room: Hall Auditorium & Atrium				

16:30-18:00	Session A8: SS06 - Track Structure and its Components	Session B8: R04 - Modelling and Simulation of Railway Vehicles	Session C8: R08 - Capacity and Comfort of Rail Transport	Session D8: SS32 - Impact of Railway on the Environment and Ecosystems	Session E8: SS34 - Bearing Condition Monitoring Technologies
Session Chair	Sakdirat Kaewunruen Makoto Ishida	Makoto Tanabe Naim Kuka	David Fletcher Daniel Schmeling	Patrizia Gregori Gilles Saussine	Constantine Tarawneh Jan Lundberg
Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
16:30-16:45	<p>[A8.01] Influence of wet and dry conditions on dynamic properties of composite and plastic bearers in railway turnout systems S. Kaewunruen*¹, M. Sechet¹, A. Freimanis², ¹University of Birmingham, UK, ²Riga Technical University, Latvia</p>	<p>[B8.01] Influence of track irregularity on dynamic response of linear induction motor wheel/rail transit system C.Z. Zang*, Q.C. Wei, Beijing Jiaotong University, China</p>	<p>[C8.01] RateSetter: Faster, safer, and better platform train interface design and operation using evolutionary optimization D.I. Fletcher*, R.F. Harrison, S. Nallaperuma, T. Karmakharm, P. Richmond, The University of Sheffield, UK</p>	<p>[D8.01] Strategy and tools for eco-homologation of railway infrastructure products: Ballast glues and creosoted wooded sleeper alternatives examples P. Gatti Gregori*, A. Martin, G. Gagnage, SNCF RESEAU, France</p>	<p>[E8.01] Defect detection system for freight railcar tapered-roller bearings using vibration techniques C. Tarawneh*, J. Montalvo, University of Texas Rio Grande Valley, USA</p>
16:45-17:00	<p>[A8.02] Examples of track performance effects related to excessive track deflection T.R. Sussmann^{1,3}, H.B. Thompson², T.D. Stark*⁴, ¹Volpe Center, USA, ²Federal Railroad Administration, USA, ³University of Hartford, USA, ⁴University of Illinois, USA</p>	<p>[B8.02] Roller rig for simulation of a curved track J. Kalivoda*, P. Bauer, Czech Technical University in Prague, Czech Republic</p>	<p>[C8.02] Railway cabin interiors: Occupant protection and structural design M.S. Carvalho*¹, A.P. Martins¹, J. Milho^{2,3}, ¹UNIDEMI, Portugal, ²Universidade de Lisboa, Portugal, ³Instituto Politécnico de Lisboa, Portugal</p>	<p>[D8.02] The comparison of the environmental and social impact of semi-trailers transport by railway wagons and road tractors A. Merksiz-Guranowska¹, J. Czerwinski², P. Daszkiewicz*², M. Andrzejewski², ¹Poznan University of Technology, Poland, ²Rail Vehicles Institute "TABOR", Poland</p>	<p>[E8.02] Dynamics simulation and analysis of rooling bearing W. Wang*, Z. Zhang, S. Song, Southwest Jiaotong University, China</p>

17:00-17:15	<p>[A8.03] Assuring a good long-term track alignment in breathing curves with continuously welded rails H.P. Braess, <i>ETH Zürich, Switzerland</i></p>	<p>[B8.03] Transverse stability of containers and swap bodies on railway flat-wagons under the action of side winds A. Dauksha*, Y. Boronenko, <i>Alexander 1 St. Petersburg State University of Transport Routes, Russia</i></p>	<p>[C8.03] Using machine learning models to predict the ride comfort perception of standing passengers in light rail vehicles T. Bettinger*, C. Schindler, <i>RWTH Aachen University, Germany</i></p>	<p>[D8.03] Tests of exhaust emissions and the fuel consumption from diesel locomotives J. Merksiz¹, W. Stawecki², P. Daszkiewicz², M. Andrzejewski², D. Gallas*², ¹Poznan University of Technology, Poland, ²Rail Vehicles Institute "TABOR", Poland</p>	<p>[E8.03] An investigation into wayside hot-box detector efficacy and optimization C. Tarawneh*, J. Aranda, V. Hernandez, C. Ramirez, <i>University of Texas Rio Grande Valley, USA</i></p>
17:15-17:30	<p>[A8.04] Proposal of a metal cushion material to develop a new hard-wearing rail pad. Comparison between two dynamic procedures to characterize the stiffness and damping A. Perez*², I.A. Carrascal¹, J.A. Polanco¹, J.A. Casado¹, D. Ferreño¹, S. Diego¹, ¹Universidad de Cantabria, Spain, ²Tejasa TC - Vibration Control, Spain</p>	<p>[B8.04] Study on vibration behavior of flexible carbody with unsteady aerodynamic loads W. Qunsheng*¹, Z. Jing¹, W. Lai¹, Z. Chuanying², ¹Southwest Jiaotong University, China, ²Sichuan Institute of Industrial Technology, China</p>	<p>[C8.04] A method of ride quality contribution analysis of railway vehicle T.W. You*, J.S. Zhou, D. Dao Gong, Z.H. Xia, W.J. Sun, <i>Tongji University, China</i></p>	<p>[D8.04] Mixing geographical tools features with EMC science to improve railway electrical environmental impact calculation G. Boussaert*, C. Reboul, M. Cucchiaro, <i>SNCF Direction de l'Ingenierie, France</i></p>	<p>[E8.04] Dynamics simulation and analysis of rolling bearing W. Tingting*, Z. Weihua, S. Dongli, <i>Southwest Jiaotong University, China</i></p>
17:30-17:45	<p>[A8.05] Experimental and analytical investigations on full-scale polymerized railway sleepers manufactured from GFRP and iron slag A. Khalil*¹, M. Al Ela¹, M. Adam¹, H. Fouad¹, H.</p>	<p>[B8.05] Dynamic response comparison of the wheelset partly and fully sprung drive M. Dub*, J. Kolar, F. Lopot <i>Czech Technical University in Prague,</i></p>	<p>[C8.05] Study on energy-absorbing structures based on upheaval deformation of thin-walled plates for railway vehicles S. Xie, N. Wang*, W. Yang, H. Li, <i>Central</i></p>	<p>[D8.05] A method for railway transport total impact calculation A. Wangai*, S. Kinzhikayev, <i>Budapest University of Technology and Economics, Hungary</i></p>	<p>[E8.05] Onboard load sensor for use in freight railcar applications C. Tarawneh*¹, J. Ley¹, D. Blackwell¹, S. Crown¹, B. Wilson², ¹University of Texas Rio Grande</p>

	Riad ¹ , A. Shanour ¹ , H. Bakry ¹ , ¹ Benha University, Egypt, ² Ain Shams University, Egypt	Faculty of Mechanical Engineering, Czech Republic	South University, China		Valley, USA, ² Amsted Rail Company, USA
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Thursday 6 September 2018					
08:30-10:30	Session A9: SS28 - Track Stiffness - Transition Zones and Inhomogeneities	Session B9: SS21 - Innovations in Running Gears	Session C9: SS24 - Train Aerodynamics	Session D9: SS19 - Future Trends in Railway Transport & SS23 - Railway Developments in the Middle East	Session E9: SS17 - Railway Noise and Vibration
Session Chair	Yann Bezin Roberto Sañudo	Andrea Bracciali Oldrich Polach	James Bell David Soper	Luigi Dell'Olio Brian Counter	Georges Kouroussis David Thompson
Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
08:30-08:45	[A9.01] Undertrack crossings as a driver of track deterioration D. Milne*, L. Le Pen, D.J. Thompson, W. Powrie, University of Southampton, UK	[B9.01] Solving groan noise problems in a metro braking system A. Bracciali*, G. Megna, University of Florence, Italy	[C9.01] Testing of an active wing system to generate transient crosswinds in wind tunnel experiments M. Müller*, K. Ehrenfried, J. Bell, C. Wagner, Technische Universität Ilmenau, Germany	[D9.01] On the perception of the variables that affect the use of railway system: The opinion of different stakeholders L. dell'Olio* ¹ , R. Sañudo ¹ , C. Katschnig ² , P. Stroh ³ , ¹ University of Cantabria, Spain, ² IITF, Austria, ³ Railistics, Germany	[E9.01] Modelling wheel/rail rolling noise for high-speed trains X. Sheng*, G. Chen, Southwest Jiaotong University, China
08:45-09:00	[A9.02] Dinatrans, a new high speed track transition solution R. Sañudo* ¹ , L. dell'Olio ¹ , I. Jardí ² , M. García ³ , F.J. Sanchez ⁴ , D. Sanchez ⁵ , ¹ University of Cantabria, Spain, ² Ferrovial Agroman S.A., Spain, ³ ADIF, Spain,	[B9.02] Stresses and strains in tyred wheels during tyre fitting process A. Bracciali, G. Megna*, University of Florence, Italy	[C9.02] Dynamic performance of high-speed train passing windbreak breach of different sizes under unsteady cross wind Z. Sun*, H.Y. Dai, H. Gao, Southwest Jiaotong Univeristiy, China	[D9.02] Availability and maintenance - A growing contradiction? P. Veit*, S. Marschnig, Graz University of Technology, Austria	[E9.02] Interior noise control of the metro cab: Sound insulation and rail corrugation X. Liu*, J. Han, X. Xiao, Z. Wen, Southwest Jiaotong University, China

	⁴ Precon S.A.U, Spain, ⁵ CI3, Spain				
09:00-09:15	[A9.03] Dynamic simulation of the V-Tras 'superstructure' transition solution S.J. Hawksbee*, S. Neves, Y. Bezin, <i>University of Huddersfield, UK</i>	[B9.03] Mechanism analysis of distortion adaptability and running stability of double T-joint bogie S.Q. Tian*, X.P. Luo, C.Y. Xiao, Y. Sun, Z.H. Xia, <i>Institute of Rail Transit, China</i>	[C9.03] An experimental and numerical study on the effects of windbreak walls on the flow around trains subjected to crosswinds S.A. Hashmi*, H. Hemida, D. Soper, <i>University of Birmingham, UK</i>	[D9.03] Dynamics studies on side-suspension monorail transportation system X. Yan*, Z. Weihua, Y. Caijin, C. Maoru, <i>Southwest Jiaotong University, China</i>	[E9.03] Study on interior noise characteristics of high speed train caused by aerodynamic excitation Y.F. Yao* ^{1,2} , Z.X. Sun ^{1,2} , G.W. Yang ^{1,2} , ¹ <i>Institution of Mechnics, China,</i> ² <i>University of Chinese academy of Sciences, China</i>
09:15-09:30	[A9.04] Dynamic analysis of train-track interaction for performance improvement of short transition zone P. Paoleng*, R. Parichartpreecha, S. Suthasupradit, <i>Naresuan University, Thailand</i>	[B9.04] Optimization and design of rail vehicle running gear components under dynamic loading C. Gomes Alves*, D. Krüger, M. Rehermann, <i>German Aerospace Center (DLR), Germany</i>	[C9.04] Establishment and precision improvement of calculation system for evaluation of vehicle overturn resistance against strong crosswind Y. Misu*, S. Takeda, K. Doi, <i>East Japan Railway Company, Japan</i>	[D9.04] Delivering city value and prosperity through mobility oriented developments B. Bollinger, <i>Arcadis, The Netherlands</i>	[E9.04] Aerodynamic noise from trains: Flow and aerodynamic noise generated by cuboids with different aspect ratios Y. Wang*, D.J. Thompson, Z. Hu, <i>University of Southampton, UK</i>
09:30-09:45	[A9.05] Hybrid simulation to evaluate the transition zone stiffness variation C. Shi* ¹ , C.F. Zhao ¹ , X. Zhang ¹ , ¹ <i>Southwest Jiaotong University, China,</i> ² <i>Guangdong University of Technology, China</i>	[B9.05] Hunting reduction control for independently driving wheels based on partial state measurement X.H. Jia*, W.J. Wang, <i>Tsinghua University, China</i>	[C9.05] Numerical simulation of the flow around a high-speed train subjected to non-uniform crosswinds M.M. Rashidi*, H. Hemida, <i>University of Birmingham, France</i>	[D9.05] Test track with R33 curve turnout and railroad crossing for its mobility S. Lin*, T. Sugimachi, Y. Suda, <i>The University of Tokyo, Japan</i>	[E9.05] Prediction and reduction of aerodynamic noise from a pantograph contact strip X.W. Liu*, D.J. Thompson, Z.W. Hu, <i>University of Southampton, UK</i>
09:45-10:00	[A9.06] Development of disruptive process for the	[B9.06] Running behaviour of modified Y25 running	[C9.06] Stochastic crosswind stability of a high-	[D9.06] A helix motion based rail vehicle operating	[E9.06] Interior noise maps test of high-speed

	<p>construction of railway transition zones (DIGITALIA) J.L. Perez Garnes*¹, M. Labrado², T. Real Herraiz², F. Ribes², J. Real Herraiz², ¹Torrescamara, Spain, ²Polytechnic University of Valencia, Spain</p>	<p>gear with double Lenoir links and cross-bracing: Wheel damage and stability V.V. Krishna*, S. Stichel, S. Hossein-Nia, <i>KTH Royal Institute of Technology, Sweden</i></p>	<p>speed train running on a hilly topography T. Li*, Z. Wang, J.Y. Zhang, W.H. Zhang, <i>Southwest Jiaotong University, China</i></p>	<p>method and system F. Al-Jobory, <i>FCT-Nova University of Lisbon. Researcher at CICS.NOVA research center-Lisbon, Portugal</i></p>	<p>train D. Wang*^{1,2}, S.C. Xie^{1,2}, Z.G. Yang^{1,2}, ¹Ministry of Education, China, ²Joint International Research Laboratory of Key Technology for Rail Traffic Safety, China</p>
10:00-10:15	<p>[A9.07] A periodic track modelling approach for the study of transition zones M. Germonpré*, G. Degrande, G. Lombaert, <i>KU Leuven, Belgium</i></p>	<p>[B9.07] Influence of polygonal wear of railway wheels on the stress of the gearbox H. Wu*, P. Wu, F. Li, <i>Southwest Jiaotong University, China</i></p>	<p>[C9.07] Simulation of the wind-driven rain on high-speed trains based on the Finite Panel Method S. Xue*, C.H. Xu, C.W. Jiang, T.Y.X. Han, <i>Beihang University, China</i></p>	<p>[D9.07] Path following control model of single vehicle for a new virtual track-based train Z. Zhang, C. Yang, W. Zhang, H. Zeng, Y. Wang, X. Yan*, <i>Southwest Jiaotong University, China</i></p>	<p>[E9.07] Noise and vibration from tramways: A comparison with prediction models W.J. Sun*¹, E. Ntotsios², G. Squicciarini², M. Toward², D.J. Thompson², ¹Tongji University, China, ²Institute of Sound and Vibration Research, UK</p>
10:15-10:30	<p>[A9.08] FE-simulation of track stiffness variations along transition zones for high-speed slab track M.X.D. Li, <i>Swedish Transport Administration, Sweden</i></p>	<p>[B9.08] Tyred wheels without braking: Structural optimization A. Bracciali, G. Megna*, <i>University of Florence, Italy</i></p>	<p>[C9.08] Numerical simulation of the train running under tornado conditions R.Z. Xu*^{1,2}, F. Wu^{1,2}, Y. Tao^{1,2}, P. Ji¹, ¹Central South University, China, ²Ministry of Education, China, ³Joint International Research Laboratory of Key Technology for Rail Traffic Safety, China, ⁴National & Local Engineering Research Center of Safety Technology for Rail Vehicle, China</p>	<p>[D9.08] The preliminary analysis of introducing 320 km/h high-speed rail in Saudi Arabia M. Ali, A. Khalil*, K. Osra, <i>Minia University, Egypt</i></p>	<p>[E9.08] Influence of installation positions and boundary conditions on sound transmission loss of metro vehicle floor structures D. Yao*¹, R. Wang², X. Xiao¹, ¹Southwest Jiaotong University, China, ²Changzhou University, China</p>

10:30-10:45	[A9.09] Improved high speed track superstructures like transition zones with Under Sleeper Pads F. Pospischil ^{1,2} , S. Vonbun ^{*1} , R. Caltabiano ¹ ¹ Getzner Werkstoffe GmbH, Austria, ² University of Innsbruck, Austria	[B9.09] Re-design of tyred wheels to optimize maintenance A. Bracciali*, G. Megna, University of Florence, Italy			[E9.09] Comparison of vehicle interior vibration and noise with different track forms Y.S. Xie ^{*1} , X.G. Gao ¹ , A.B. Wang ¹ , L. Li ² , ¹ Shanghai University of Engineering Science, China, ² Tongji University, China
10:30-11:00	Coffee Break / Refreshments Room: Hall Auditorium & Atrium				
11:00-13:00	Session A10: SS15 - Assessment of the Behaviour of the Rail Track and Substructure	Session B10: R06 - Traction, Braking and Transmission Systems & SS20 - Using Big Data to Increase Railway Resilience	Session C10: SS24 - Train Aerodynamics	Session D10: SS13 - Digital Engineering in the Rail Sector	Session E10: SS17 - Railway Noise and Vibration
Session Chair	Eduardo Fortunato Liedi Bernucci	Egidio Di Gialleonardo Howard Parkinson	Guowei Yang David Soper	Marin Marinov Florin Nemtanu	Xiaozhen Sheng David Thompson
Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
11:00-11:15	[A10.01] A research project on the reinforcement of old railway track platforms using short soil binder columns E. Fortunato ^{*1} , A. Paixão ¹ , P. Morais ¹ , C. Santos ¹ , A. Francisco ¹ , J.N. Varandas ² , F. Asseiceiro ³ , J. Cruz ³ , N. Cruz ³ , ¹ National Laboratory for Civil Engineering (LNEC), Portugal, ² Universidade NOVA de Lisboa, Portugal, ³ Mota-Engil,	[B10.01] Model based observer synthesis for the longitudinal dynamics estimation of a wheelset C. Schwarz ^{*1} , J. Brembeck ¹ , B. Heckmann ² , ¹ German Aerospace Center, Germany, ² Knorr-Bremse Systeme für Schienenfahrzeuge GmbH, Germany	[C10.01] Study of the pressure loads on cavities in high-speed railway tunnels D. Heine ^{*1} , K. Ehrenfried ¹ , H. Kühnelt ² , S. Lachinger ² , M. Rudolph ² , A. Vorwagner ² , F. Saliger ³ , ¹ German Aerospace Center, Germany, ² Austrian Institute of Technology, Austria, ³ Austrian Federal Railways, Austria	[D10.01] Virtualisation of infrastructure as part of digital railway system – digital architecture F.C. Nemtanu ^{*1} , L.G. Obreja ¹ , M. Marinov ² , ¹ Politehnica University of Bucharest, Romania, ² Newcastle University, UK	[E10.01] A FEM/BEM approach for predicting railway ground vibration induced by localized defects G. Kouroussis ^{*1} , A. Romero ² , P. Galvín ² , B. Olivier ¹ , D. Connolly ³ , ¹ University of Mons, Belgium, ² Universidad de Sevilla, Spain, ³ The University of Leeds, UK

	<i>Engenharia e Construção, S.A., Portugal</i>				
11:15-11:30	<p>[A10.02] Long-term monitoring of railway track section improved by geocomposite placed beneath the ballast bed L. Hornicek*¹, M. Hempel², ¹Czech Technical University in Prague, Faculty of Civil Engineering, Czech Republic, ²NAUE GmbH & Co. KG, Germany</p>	<p>[B10.02] Detection of slips of wheels from acceleration measured in a train cabin K. Nakano*¹, H. Kamiya¹, T. Kaizuka¹, H. Iijima², H. Kutsukake², ¹The University of Tokyo, Japan, ²East Japan Railway Company, Japan</p>	<p>[C10.02] A CFD analysis on the aerodynamics of a freight train passing through a tunnel P. Iliadis*, H. Hemida, C. Baker, D. Soper, <i>University of Birmingham, UK</i></p>	<p>[D10.02] Diagnostyx: Web-based remote condition monitoring S.K. Hashmi*, P. Teal, J. Conlon, <i>SNC-LAVALIN Rail & Transit, UK</i></p>	<p>[E10.02] Comparison of different methods of analyzing masonry buildings subjected to vibration induced by railways F. Pachla*, B. Kouch, T. Tatara, <i>Cracow University of Technology, Poland</i></p>
11:30-11:45	<p>[A10.03] Key drivers for rail track settlement and its prediction using FE model I. Grossoni*¹, J.Y. Shih², Y. Bezin¹, ¹University of Huddersfield, UK, ²University of Birmingham, UK</p>	<p>[B10.03] Research on optimal sensor configuration for fault diagnosis of Chinese standard EMU braking system based on the first quadrant criterion J.Y. Zuo*, J.L. Liu, G. Hu, <i>Tongji University, China</i></p>	<p>[C10.03] Experimental and numerical investigation of the aerodynamic impact of roof elements on high-speed trains J. Tschepe*¹, D. Fischer², C.N. Nayeri¹, C.O. Paschereit², ¹Berliner Institut für Technologietransfer (BIT GmbH), Germany, ²Technische Universität Berlin, Germany</p>	<p>[D10.03] Human factors in railway digitalisation and automation A. Naumann*, B. Thomas-Friedrich, N. Brandenburger, J. Grippenkov, <i>German Aerospace Center, Germany</i></p>	<p>[E10.03] Scoping assessment of soil vibrations due to railway traffic D. López-Mendoza*, P. Galvín, D.P. Connolly, A. Romero, <i>Universidad De Sevilla, Spain</i></p>
11:45-12:00	<p>[A10.04] Test of dynamic behavior of the track structures with elastic sleeper and composite sleeper Z.H. Zhao*¹, Y.T. Shen¹, X. Yan¹, H. Geng¹, Y. Gao², C.H. Li¹, ¹Southwest Jiaotong University,</p>	<p>[B10.04] Hybrid rail vehicles using digital hydraulics W.H.S. Rampen*, S.M. Laird, G.P. Voller, <i>Artemis Intelligent Power Ltd., UK</i></p>	<p>[C10.04] Aerodynamic resistance reduction technology based on microstructure surface of high-speed train M. Li*, Y. Wang, B. Liu, F.B. Kong, <i>CRRC Tangshan, China</i></p>	<p>[D10.04] Improvement of alarm system to inform workers of approaching trains K. Michishita*, M. Sonobe, T. Gocyou, T. Sakamoto, <i>Saitama, Japan</i></p>	<p>[E10.04] State of art and guidelines for vibration assessment in buildings near railways C.S. Barbosa*, T.G. Porto, C.E.N. Mazzilli, D.T. Monteiro, <i>University</i></p>

	China, ² China Railway Eryuan Engineering Group Co. Ltd, China				of Sao Paulo, Brazil
12:00-12:15	<p>[A10.05] Field investigation of a freight railway trackbed composed by a bituminous subballast in Brazil T.F. Alves^{*1}, P.A.M. Pereira¹, R.S. Motta¹, J. Pires¹, E. Moura¹, R. Costa¹, G.B. Castro¹, L.L. Bernucci¹, R. Nogueira², ¹Universidade de São Paulo, Brazil, ²MRS Logística S.A., Brazil</p>	<p>[B10.05] Sheffield tram train - using data management to inform the industry I. Ambrose, Network Rail Infrastructure Limited, UK</p>	<p>[C10.05] Moving model rig experimental investigation of the micro pressure wave D.L. Guo[*], G.W. Yang, Y. Guo, Chinese Academy of Sciences, China</p>	<p>[D10.05] TrackWater: Supporting high-value, low-cost rail network drainage asset management J. Raja^{*3}, M. Harding¹, N. Davies¹, M. Rouncefield¹, U. Roedig¹, J. Walden², O. Devan³, A. Pages Maso⁴, D. Sudell², L. Sugden², ¹Lancaster University, UK, ²InTouch Ltd, UK, ³Network Rail, UK, ⁴Transport Systems Catapult, UK</p>	<p>[E10.05] An efficient decoupled numerical procedure for the prediction of ground-borne vibrations due to railway traffic F. Perotti, M. Tomasin[*], S. Alfi, A. Collina, Politecnico di Milano, Italy</p>
12:15-12:30	<p>[A10.06] Applying track design models to the assessment of track performance and remaining life T.R. Sussmann¹⁻³, H.B. Thomson¹, T.D. Stark^{*4}, ¹Volpe Center, USA, ²Federal Railroad Administration, USA, ³University of Hartford, USA, ⁴University of Illinois, USA</p>	<p>[B10.06] Real time processing of large raw data streams from distributed acoustic sensing for train tracking C. Wiesmeyr^{*1}, M. Litzenberger¹, A. Papp¹, H. Garn¹, G. Neunteufel², ¹AIT Austrian Institute of Technology GmbH, Austria, ²nbg-fosa GmbH, Austria</p>	<p>[C10.06] Improvement of high-speed trains aerodynamic efficiency by microblowing Y. Shkvar[*], S. E. J-C. Cai, A. Kryzhanovskiy, A. Jamea, Zhejiang Normal University, China</p>	<p>[D10.06] Use of images associated to georeferencing as a tool for monitoring the state of conservation of railways C.M.C. Alecrim, V.T.F. Castelo Branco[*], Federal University of Ceara, Brazil</p>	<p>[E10.06] Study on roof device high-static-low-dynamic-stiffness vibration isolators of the low-floor tramcar Y. Sun[*], D. Gong, J.S. Zhou, W.J. Sun, Z.H. Xia, Tongji University, China</p>
12:30-12:45	<p>[A10.07] Integrated maintenance model for heavy haul tracks – general basis and case studies J. Pires^{*1}, A.G. Dumont², L.L. Bernucci¹, E.M. Fortunato³, ¹University of Sao Paulo (EPUSP), Brazil,</p>	<p>[B10.07] Predicting wheels slides; traditional and future methods H.J. Parkinson[*], G. Bamford, Digital Rail Limited, UK</p>	<p>[C10.07] Numerical analysis on drag reduction of high-speed train using biomimetic concave surface B. Yin[*], G.W. Yang, Chinese Academy of Sciences,</p>	<p>[D10.07] Practical methods to integrate cyber security testing and safety critical systems J.M. Mckenney, NCC Group, UK</p>	<p>[E10.07] Mitigation of vibrations induced by railway traffic through soil buried inclusions: A numerical study A. Castanheira-Pinto^{*1}, P. Alves</p>

	² École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, ³ National Laboratory of Civil Engineer (LNEC), Portugal		China		Costa ¹ , L. Godinho ² , P. Amado-Mendes ² , ¹ University of Porto, Portugal, ² University of Coimbra, Portugal
12:45-13:00	[A10.08] Numerical modelling of dynamic train/ slab track interaction focusing on long-term performance and resiliency to extreme weather events S.R. Matias*, P.A. Ferreira, Instituto Superior Técnico, Portugal		[C10.08] Control of aerodynamic characteristics for rail vehicle by surface dielectric barrier discharge W.F. Wei, Southwest Jiaotong University, China	[D10.08] Blockchain technology as a mechanism for digital ticketing J.D. Preece*, J.M. Easton, University of Birmingham, UK	[E10.08] Study on unbalanced vibration suppression for under-chassis equipment of high speed EMU trains Z. Xia*, D. Gong, J. Zhou, W. Sun, T. You, S. Tian, Tongji University, China
13:00-13:15				[D10.09] Application of blockchain technology in railway systems F.C. Nemtanu* ¹ , J. Schlingensiepen ² , I.M. Costea ¹ , P.G. Peiu ¹ , M. Marnov ³ , ¹ Politehnica University of Bucharest, Romania, ² Technical University of Ingolstadt, Germany, ³ Newcastle University, UK	
13:00-14:00	Lunch Room: Noray Restaurant				
14:00-16:00	Session A11: SS15 - Assessment of the Behaviour of the Rail Track and Substructure	Session B11: R02 - Vehicle-Infrastructure Interaction	Session C11: SS24 - Train Aerodynamics	Session D11: SS02 - Switches and Crossings Developments	Session E11: R07 - Condition Monitoring and Maintenance Planning
Session Chair	Eduardo Fortunato Liedi Bernucci	Enrico Meli João Abdala	Hassan Hemida James Bell	Valeri Markine Elias Kassa	Hitoshi Tsunashima Kevin Xiao Wang
Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
14:00-14:15	[A11.01]	[B11.01]	[C11.01]	[D11.01]	[E11.01]

	<p>Calibration of a high-cycle accumulation model for granular track layers using tests of variable cyclic load amplitudes</p> <p>J.N. Varandas^{*1}, A. Paixão², E. Fortunato², P. Holscher³, ¹NOVA University of Lisbon, Portugal, ²National Laboratory for Civil Engineering (LNEC), Portugal, ³Deltares, The Netherlands</p>	<p>Study on the potential effect of sloshing cargoes on rail endurance</p> <p>J.A. Romero¹, F. Otremba², A.A. Lozano-Guzman^{*3}, ¹Queretaro Autonomous University, Mexico, ²Federal Institute of Materials Research and Testing (BAM), Germany, ³Applied Science and Advanced Technology (CICATA), Mexico</p>	<p>Full scale investigation of train aerodynamic flows</p> <p>D. Soper[*], C. Baker, University of Birmingham, UK</p>	<p>A broad approach to switch profiles optimisation using multibody dynamic simulation</p> <p>A. Foan², Y. Bezin^{*1}, D. Kostovasilis¹, S.N. Neves¹, ¹University of Huddersfield, UK, ²Andy Foan Ltd, UK</p>	<p>Probabilistic evaluation of track geometry degradation using high frequency measurement data</p> <p>H. Yoshida[*], S. Ymamoto, S. Motoyoshi, T. Konishi, East Japan Railway Company, Japan</p>
14:15-14:30	<p>[A11.02] A FE-based 2-D ballast settlement analysis of railway track with a rail joint</p> <p>K. Koro[*], K. Abe, Niigata University, Japan</p>	<p>[B11.02] Study on dynamic stress distribution law of embedded track subgrade of modern tram</p> <p>Q.S. Feng[*], K. Sun, W. Wang, X.Y. Lei, East China Jiaotong University, China</p>	<p>[C11.02] Numerical simulation on the unsteady turbulent flow and aerodynamic noise of the air conditioner for high speed train</p> <p>W. Wang[*], P. Lin, S. Liu, D. Chen, CRRC Qingdao Sifang Co., Ltd., China</p>	<p>[D11.02] Methods of operating switches - A comparative study</p> <p>A.R. Foan, Andy Foan Limited, UK</p>	<p>[E11.02] Estimating track condition based on axle box accelerations of revenue trains</p> <p>M. Zimmermann[*], V. Dertimanis, E. Chatzi, F. Corman, ETH Zurich, Switzerland</p>
14:30-14:45	<p>[A11.03] Evaluation of water flow in railway structures with different solutions for the sub-ballast layer</p> <p>R.S. Maia, V.T.F. Castelo Branco[*], Universidade Federal do Ceará, Brazil</p>	<p>[B11.03] Identification of dynamic loads generated by trains in motion and estimation of static load</p> <p>A. Mosleh[*], P. Alves Costa, R. Calçada, University of Porto, Portugal</p>	<p>[C11.03] Study on the aerodynamic and aerothermodynamic characteristics of typical vacuum train configurations under operating conditions</p> <p>C.H. Xu[*], T. Zhong, C.W. Jiang, H.Y. Lin, Z.J. Ouyang, X. He, Z.H. Li, Beihang University, China</p>	<p>[D11.03] Specification development for a new railway turnout, focusing on a reduced need for maintenance</p> <p>J. Lundberg, Division of Operation & Maintenance, Sweden</p>	<p>[E11.03] Analysis of phased array ultrasonic transducers for detection of transverse defects in rails</p> <p>H. Benzeroual^{*1}, A. Khamlichi², A. Zakriti², ¹Faculty of Sciences of Tetouan, Morocco, ²National School of Applied Sciences of Tetouan, Morocco</p>

14:45-15:00	<p>[A11.04] Unsaturated analysis of a railway structural profile in Brazil considering climatic data J. Pires*, G. Castro, R. Motta, T. Alves, P. Pereira, L. Zipoli, L.L. Bernucci, <i>Polytechnic School of the University of Sao Paulo (EPUSP), Brazil</i></p>	<p>[B11.04] Scaled railway track for the study of the dynamics of scaled railroad vehicles R. Chamorro*¹, J.F. Aceituno³, P. Urda¹, S. Muñoz¹, J.L. Escalona², ¹<i>Universidad de Sevilla, Spain,</i> ²<i>University of Aarhus, Denmark,</i> ³<i>Universidad de Jaén, Spain</i></p>	<p>[C11.04] Influence investigation of local structural parameters on aerodynamic performances of high-speed trains G. Yang*, D. Guo, Z. Sun, <i>Chinese Academy of Sciences, China</i></p>	<p>[D11.04] Spatial alignment of track recording car data in turnouts E. Hovad*¹, J.F. Andersen¹, C. Thyregod¹, A.F.S. Rodrigues², B.K. Ersbøll¹, ¹<i>Technical University of Denmark, Denmark,</i> ²<i>Banedanmark, Denmark</i></p>	<p>[E11.04] Influence of rail inclusions on fatigue crack initiation and propagation C. Nkundineza¹, ¹<i>Addis Ababa University, Ethiopia,</i> ²<i>University of Nebraska- Lincoln, USA</i></p>
15:00-15:15	<p>[A11.05] Railway ballast behaviour of steel furnace slag aggregate under monotonic triaxial load B.G. Delgado*^{1,3}, A. Viana da Fonseca¹, E. Fortunato², D.R. Coelho¹, ¹<i>University of Porto - FEUP, Portugal,</i> ²<i>National Laboratory for Civil Engineering - LNEC, Portugal,</i> ³<i>Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq, Brazil</i></p>	<p>[B11.05] Numerical analysis on railway concrete slab track under different loading cases J.Y. Kim, S.H. Lee, K.H. Cho*, <i>Seoul National University of Science & Technology, Republic of Korea</i></p>	<p>[C11.05] Numerical of snow and ice causes of high-speed train bogie based on IDDES method M.Y. Liu*¹, G.J. Gao¹, J.B. Wang¹, Y. Zhang¹, ¹<i>Central South University, China,</i> ²<i>National & Local Joint Engineering Research Center of Safety Technology for Rail Vehicle National & Local Joint Engineering Research Center of Safety Technology for Rail Vehicle, China,</i> ³<i>Joint International Research Laboratory of Key Technology for Rail Traffic Safety, China,</i> ⁴<i>Ministry of Education, China</i></p>	<p>[D11.05] Simulation method of an object detection function of a turnout and a switch machine S. Shiomi*, Y. Oshimi, K. Numata, <i>Railway Technical Research Institute, Japan</i></p>	<p>[E11.05] Train load identification based on the measurement of rail strains A. Pau*¹, F. Vestroni¹, E. Duca², M. Platini³, ¹<i>Sapienza Università di Roma, Italy,</i> ²<i>Generale Costruzioni Ferroviarie, Italy,</i> ³<i>Acesystem, Italy</i></p>
15:15-15:30	<p>[A11.06] Effect of subsurface variability on the</p>	<p>[B11.06] Coupling multi-body vehicle dynamics and</p>	<p>[C11.06] Research on aerodynamics and</p>	<p>[D11.06] Vertical stiffness problems and their</p>	<p>[E11.06] A study on wheel wear characteristics</p>

	<p>dynamic stiffness of railway infrastructures in the Netherlands B. Zuada Coelho*, M. Hijma, <i>Deltares, The Netherlands</i></p>	<p>finite elements models: Case studies for a flexible railway track D. Sorrentino*, S. Krafft, S. Le Scouezec, P. Dupont, E. Laurans, <i>SNCF Réseau, France</i></p>	<p>multi-body dynamics tight coupling method used in high speed train Z.L. Ji*, G.W. Yang, <i>Chinese Academy of Sciences, Beijing, China, China</i></p>	<p>countermeasures in Finnish railway turnouts R. Varis*¹, A. Nurmikolu², H. Luomala¹, ¹<i>Tampere University of Technology, Finland, ²Trackwise Oy, Finland</i></p>	<p>of high-speed train S. Hara*¹, K. Nishimura¹, Y. Terumichi², ¹<i>Central Japan Railway Company, Japan, ²Sophia University, Japan</i></p>
15:30-15:45	<p>[A11.07] Evaluation of track support stiffness and track impact factor for ballast and concrete track systems Y-G. Park*, K-H. Oh, H-J. Lim, <i>Seoul National University of Science & Technology, Republic of Korea</i></p>	<p>[B11.07] Application of multi-body simulation for assessing track geometry defects based on vehicle dynamics S. Krafft, D. Sorrentino*, V. Rynik, P. Dupont, E. Laurans, <i>SNCF Réseau, France</i></p>	<p>[C11.07] Effect of wall gaps on aerodynamic characteristics of evacuated tube transportation trains H.Y. Lin*, T. Zhong, C.W. Jiang, C.H. Xu, <i>Beihang University, China</i></p>	<p>[D11.07] Design and analysis of cast railway crossings: Experimentation and simulation H. Persson*^{1,2}, J.M. Ritchie¹, M.C. Westoby², ¹<i>Heriot-Watt University, UK, ²Progress Rail Services UK Ltd, UK</i></p>	<p>[E11.07] Development of an innovative wheel damage detection system (DTD-SYSTEM) R. Auñón*¹, B. Baydal², F. Ribes-Llario², J. Real Herraiz², ¹<i>AMINSA, Spain, ²Polytechnic University of Valencia, Spain</i></p>
15:45-16:00	<p>[A11.08] Indirect assessment of railway track vertical stiffness A. Paixão^{1,2}, E. Fortunato*¹, P. Campos³, ¹<i>National Laboratory for Civil Engineering (LNEC), Portugal, ²University of Porto, Portugal, ³University of Porto, Portugal</i></p>	<p>[B11.08] Modeling of the railway track in studying the rolling stock dynamics S. Myamlin*, I. Bondarenko, <i>Dnipropetrovsk National University of Railway Transport named after academician V. Lazaryan, Ukraine</i></p>		<p>[D11.08] Stochastic analysis of switch retaining force O. Plasek*, V. Salajka, Z. Cada, <i>Brno University of Technology, Czech Republic</i></p>	<p>[E11.08] On an optical approach to monitor roundness deviations in railway wheels A. Walawalkar, N. Jagodzinski*, H. Neumann, C. Schindler, <i>RWTH Aachen University, Germany</i></p>
16:00-16:30	Coffee Break / Refreshments Room: Hall Auditorium & Atrium				
16:30-18:00	<p>Session A12: SS06 - Track Structure and its Components</p>	<p>Session B12: R08 - Capacity and Comfort of Rail Transport & SS04 - Big Data Risk Analysis - IT Solutions for Safer Trains</p>	<p>Session C12: SS09 - Signalling - Safety, Security and Train Localization</p>	<p>Session D12: SS02 - Switches and Crossings Developments</p>	<p>Session E12: R07 - Condition Monitoring and Maintenance Planning</p>

Session Chair	Sakdirat Kaewunruen Makoto Ishida	David Fletcher Daniel Schmeling	Raoul R. Schild João Abdala	Valeri Markine Yann Bezin	Yujin Lim Kevin Xiao Wang
Room	Tramuntana	Garbi 2	Mestral 1 & 2	Mestral 3 & 4	Llevant 5
16:30-16:45	[A12.01] Role of rail fastening on track design and maintenance M. Ishida, <i>Nippon Koei, Japan</i>	[B12.01] Evaluation of novel ventilation concepts for train compartments using thermal manikins and subject trials D. Schmeling*, H-J. Hörmann, <i>German Aerospace Center (DLR), Germany</i>	[C12.01] Safe and precise localisation of railway objects GNSS multisensor based architecture for highly accurate and safe object localisation in railways E. Schnieder*, R. Schild, U. Becker, A. Brand, T. Freissler, <i>Prof. Schnieder Assessment and Consulting, Germany</i>	[D12.01] Development of numerical tool for railway crossing geometry assessment and improvement X. Liu, J.J.J. Wegdam, V.L. Markine*, <i>Delft University of Technology, The Netherlands</i>	[E12.01] Railway axle corrosion gap analysis P. Sharples*, A. Beagles, <i>University of Sheffield, UK</i>
16:45-17:00	[A12.02] Dynamic response characteristics of prestressed concrete sleeper in consideration of various track irregularities T. Watanabe*, K. Goto, K. Matsuoka, S. Minoura, <i>Railway Technical Research Institute, Japan</i>	[B12.02] Thermal comfort condition of passengers in naturally ventilated train stations J. Nakano* ¹ , S. Tanabe ² , K. Sakamoto ³ , ¹ <i>Tokai University, Japan</i> , ² <i>Waseda University, Japan</i> , ³ <i>East Japan Railway Company, Japan</i>	[C12.02] FPGA implementation of a video-based characterization of GNSS reception system along a railway line R. Hmida*, A. Flancquart, J. Marais, <i>University of Lille, France</i>	[D12.02] Design evaluation of flange back steering for railway switches Y. Bezin ¹ , D. Kostovasilis* ¹ , S. Neves ¹ , A. Foan ² , ¹ <i>University of Huddersfield, UK</i> , ² <i>ERT, UK</i>	[E12.02] Study of smart wagon's measurement error using interval analysis L.C. Medeiros* ^{1,2} , P.H.O. Silva ¹ , E.G. Nepomuceno ¹ , ¹ <i>MRS Logística S.A., Brazil</i> , ² <i>UFES, Brazil</i>
17:00-17:15	[A12.03] Numerical simulation of HAS sleeper using hyperelastic behaviour of resilient pad T.S. Phan*, D. Medina-Pineda, <i>Alstom, France</i>	[B12.03] Research on comprehensive thermal control technology of a tram based on nanomaterials F.B. Kong*, M. Li, B. Liu, <i>CRRC Tangshan</i>	[C12.03] Prognostics and health management of railway track circuits P. Dersin ² , V. Khemani ¹ , R. Magee ² , B. Labarthe* ² , M. Azarian ¹ , M. Pecht ¹ , ¹ <i>University of Maryland, USA</i> ,	[D12.03] Switches for embedded track A.R. Foan*, C. Penny, <i>Embedded Rail Technology Limited, UK</i>	[E12.03] Train based differential eddy current sensor system for rail fastener detection P. Chandran* ¹ , M. Rantatalo ¹ , H. Lind ² , J. Odelius ¹ , ¹ <i>Lulea</i>

		Co., Ltd., China	² Alstom, France		University of Technology, Sweden, ² Bombardier Transport, Sweden
17:15-17:30	<p>[A12.04] Innovative railway sleeper design increasing track lateral resistance (DINTRA) F. Fernández Martínez*¹, A. Zornoza Arnao², F. Ribes-Llario², J. Real Herraiz², ¹ACCISA, Spain, ²Polytechnic University of Valencia, Spain</p>	<p>[B12.04] Experimental investigation on heating performance of ASHP with VI for rail vehicles at different ambient temperature X.X. Han¹, H.M. Zou¹, H.B. Xu*¹, T.T. Jin¹, C.Q. Tian¹, W. Kang¹, ¹Key Laboratory of Cryogenics, Technical Institute of Physics and Chemistry, CAS, China, ²Henan Polytechnic University, China, ³Shan Dong Longertek Technology Co.,Ltd., China, ⁴CRRC Changchun Railway Vehicles Co., Ltd, China</p>	<p>[C12.04] Application of STAMP/STPA to railway signalling system Y. Takano*, K. Sugiura, T. Kawano, <i>East Japan Railway Company, Japan</i></p>	<p>[D12.04] A conceptual design for a new railway switch and crossing system J.Y. Shih*¹, R. Ambur², H.C. Boghani², H. Hemida¹, E. Stewart¹, C. Roberts¹, R. Dixon², C.P. Ward², ¹University of Birmingham, UK, ²Loughborough University, UK</p>	<p>[E12.04] Development of a system for continuous inspection of grooved and vignole rails; Application of the system in the Oporto subway line, detection and characterization of defects J. Sousa*¹, H. Carrasqueira¹, M. Amorim², N. Teixeira³, ¹ISQ Lisbon, Portugal, ²ISQ Oporto, Portugal, ³Metro do Porto, Portugal</p>
17:30-17:45		<p>[B12.05] Using text and data analytics to predict track incidents T.P. Williams*¹, J. Betak², ¹Rutgers University, USA, ²Collaborative Solutions, LLC, USA</p>	<p>[C12.05] A study on the wireless communication method for emergency broadcasting system in metro environments S.H. Jang*¹, D.K. Shin¹, S.H. Yun¹, H.G. Jung¹, S.G. Jin¹, K.T. Lim¹, H. Lee², N. Park², ¹Korea Electronics Technology Institute, Republic of Korea, ²Seoul Metro, Republic of Korea</p>	<p>[D12.05] Selection of novel concepts for railway track switches and crossings H.C. Boghani¹, R. Ambur*¹, R.M. Goodall¹, C.P. Ward¹, L. Saade², M. Blumenfeld², C. Roberts², R. Dixon¹, ¹Loughborough University, UK, ²University of Birmingham, UK</p>	<p>[E12.05] An inspection system to detect defects on railway tunnels B. V. Farahani*^{1,2}, F. Barros², P. Sousa^{1,2}, P. Tavares², P. Moreira², ¹University of Porto, Portugal, ²Institute of Science and Innovation in Mechanical and Industrial Engineering, Portugal</p>

17:45-18:00			<p>[C12.06] The concept of repeating signals in traffic control systems on street running tram and light rail routes A. Popioek, <i>Wroclaw University of Science and Technology, Poland</i></p>		<p>[E12.06] Anomaly detection in vehicle/track interaction data for improving track geometry assessment methods B. Luber*¹, G. Trummer¹, J. Fuchs¹, L. Burger-Ringer², ¹<i>Virtual Vehicle Research Center, Austria</i>, ²<i>Graz University of Technology, Austria</i></p>
18:00-18:15	Close of conference				