

Programme

**The Sixth International Conference on Railway
Technology:
Research, Development and Maintenance**

incorporating

**The 10th International Symposium on
Speed-up and Sustainable Technology for Railway and
Maglev Systems**



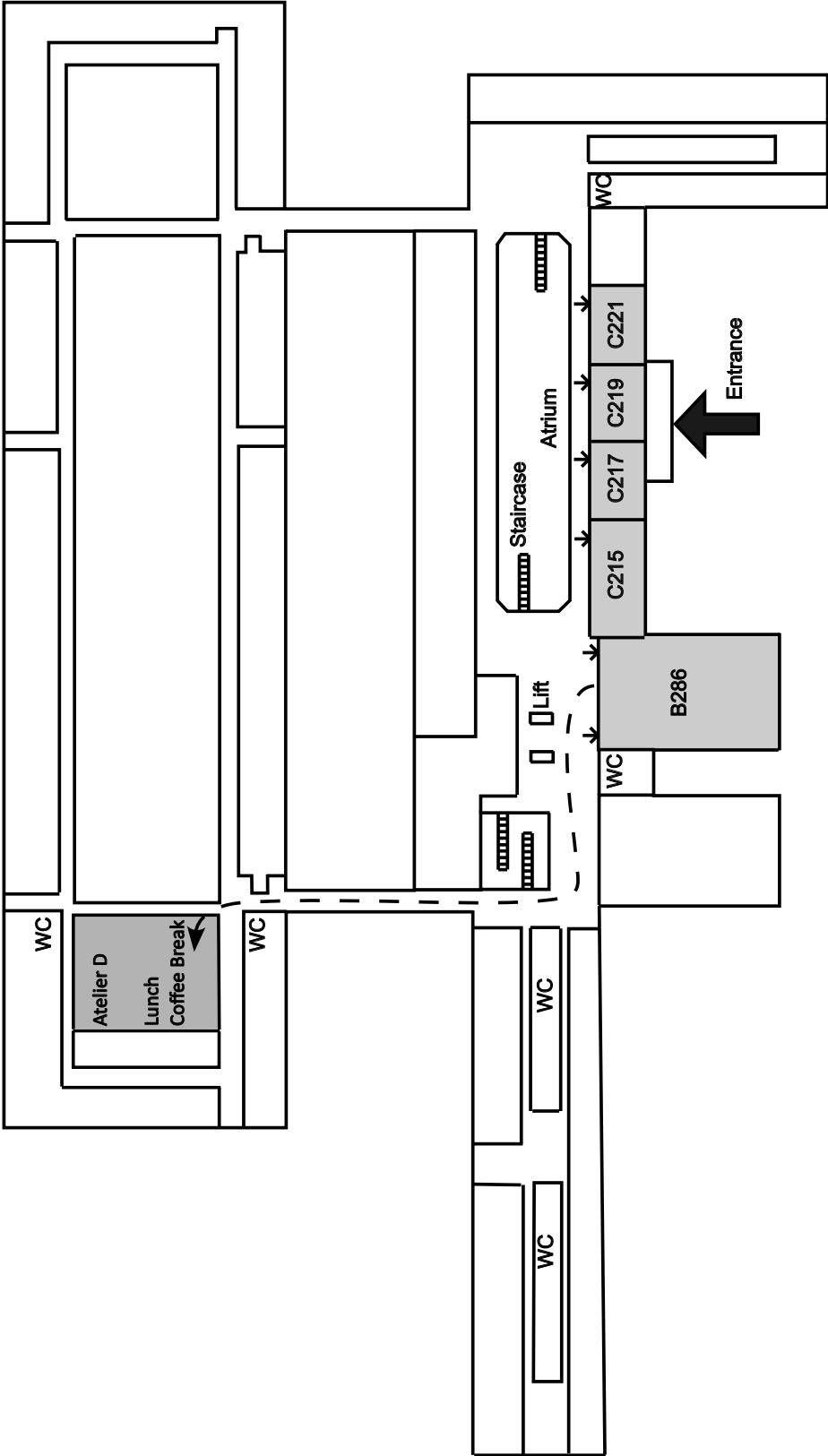
1-5 September 2024
Prague, Czech Republic

Organised in co-operation with
the Faculty of Civil Engineering, Czech Technical University in Prague



**FACULTY OF CIVIL
ENGINEERING
CTU IN PRAGUE**

Venue layout



How to find a paper in the conference proceedings

The contributed papers are published in a summary volume with the full papers available as follows:

- **Volume RW**

<https://www.ctresources.info/ccc/pub.html?f=v7rw24>

Proceedings of the Sixth International Conference on Railway Technology: Research, Development and Maintenance

J. Pombo (Editor)

Civil-Comp Press, 2024

In this programme the letters immediately preceding a paper title refer to the volume identifier given above. For example RW.2.2 refers to the second paper in the second section of Volume RW, *Proceedings of the Sixth International Conference on Railway Technology: Research, Development and Maintenance*.

A note for authors presenting papers and chairmen

All authors should meet at the front of the meeting room for their session at least 10 minutes before the session starts. Each contributed paper has been allocated 15 minutes for presentation and questions. Chairmen should indicate when 10 minutes have passed and again after 12 minutes that the presenter should immediately finish. Three minutes are available for questions and comments.

Invited lectures have been allocated 30 minutes in total, of which 5 minutes may be used for questions. Authors are kindly asked to keep to the time allocated to them by the Chairmen. Authors are discouraged from using their own laptops for presentation unless absolutely necessary, in which case they should ensure that they can quickly and efficiently start their presentation when requested by the Chairmen. Chairmen are requested to keep to the timetable. Changes to the programme will be indicated on the copies of the programme displayed on the conference timetable board and at the entrance to each of the rooms.

As a courtesy and in politeness to all speakers and other participants, please turn off your mobile phone whenever you enter any of the meeting and lecture rooms.

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Conference timetable

Day 1: Sunday, 1st September 2024

12:30-18:00 Registration desk open

14:00-14:15 Conference opening

14:15-15:45 Opening plenary lectures

15:45-16:15 Coffee / Tea Break

16:15-18:15 Invited lectures

18:15-19:30 Welcome drink reception

Day 2: Monday, 2nd September 2024

08:00-16:30 Registration desk open

09:00-10:30 Conference session

10:30-11:00 Coffee / Tea Break

11:00-13:00 Conference session

12:45-13:45 Lunch - admission by ticket

14:00-16:00 Conference session

16:00-16:30 Coffee / Tea Break

16:30-18:00 Conference session

Day 3: Tuesday, 3rd September 2024

08:00-16:30 Registration desk open

09:00-10:30 Conference session

10:30-11:00 Coffee / Tea Break

11:00-13:00 Conference session

12:45-13:45 Lunch - admission by ticket

14:00-16:00 Conference session

16:00-16:30 Coffee / Tea Break

16:30-18:00 Conference session

19:00-22:00 Conference dinner, Hotel Bohemia - admission by ticket

Conference timetable

Day 4: Wednesday, 4th September 2024

08:00-11:00 Registration desk open

09:00-10:30 Conference session

10:30-11:00 Coffee / Tea Break

11:00-13:00 Conference session

12:45-13:45 Lunch - admission by ticket

Day 5: Thursday, 5th September 2024

Technical visits - admission by advance registration

Conference timetable

Day 1, Sunday	
Time	Room C286
14:00-14:15	Conference opening page 9
14:15-15:45	Opening plenary lectures page 9
15:45-16:15	Coffee Break
16:15-18:15	Invited lectures page 9
18:15-19:30	Welcome drink reception, page 9

Day 2, Monday				
Time	Room C215	Room C217	Room C219	Room C221
09:00-10:30	Session 3 page 10	Session 2 and 4 page 11	Session 11 page 12	Session 21 page 13
10:30-11:00	Coffee Break			
11:00-13:00	Session 3 page 14	Session 4 page 15	Session 7 page 16	Session 2 and 18 page 17
12:45-13:45	Lunch			
14:00-16:00	Session 16 page 18	Session 2 and 15 page 19	Session 20 page 20	Session 10 page 21
16:00-16:30	Coffee Break			
16:30-18:00	Session 13 page 22	Session 2 and 15 page 23	Session 27 and 26 page 24	Session 24 and 28 page 25

For the content of these sessions, please, see the conference proceedings.

Conference timetable

Day 3, Tuesday				
Time	Room C215	Room C217	Room C219	Room C221
09:00-10:30	Session 16 page 26	Session 5 page 27	Session 2 and 25 page 28	Session 10 page 29
10:30-11:00	Coffee Break			
11:00-13:00	Session 3 page 30	Session 2 and 5 page 31	Session 7 page 32	Session 17 page 33
12:45-13:45	Lunch			
14:00-16:00	Session 11 page 34	Session 2 and 9 page 35	Session 6 page 36	Session 12 page 37
16:00-16:30	Coffee Break			
16:30-18:00	Session 4 page 38	Session 22 page 39	Session 19 page 40	Session 13 page 41

Day 4, Wednesday				
Time	Room C215	Room C217	Room C219	Room C221
09:00-10:30	Session 8 page 42	Session 5 page 43	Session 14 page 44	Session 2 and 23 page 45
10:30-11:00	Coffee Break			
11:00-13:00	Session 8 page 46	Session 2 and 9 page 47	Session 14 and 12 page 48	Session 6 page 49
12:45-13:45	Lunch			

For the content of these sessions, please, see the conference proceedings.

Day 1: Sunday, 1 September 2024: Room C286

14:00-14:15

Conference opening

Professor J. Pombo
University of Huddersfield, United Kingdom

Professor H. Tsunashima
Nihon University, Japan

14:15-15:45: Keynote Lectures

RW.1.1 Advances in High-Temperature Superconducting Pinning Maglev for High-Speed/Ultra-High-Speed Rail Transport

W. Zhang, Z. Deng, H. Li, J. Zheng and W. Lei

RW.1.2 Real-World Exploration of Wheel-Rail Contact: Challenges for Condition-Based Maintenance

A. Matsumoto

15:45-16:15: Coffee Break

16:15-18:15: Invited Lectures

RW.2.2 Recent Developments in Freight-Train Aerodynamics at the German Aerospace Center

J. Bell, A. Buhr, L. Siegel, R. Volkert, O. Michael, C. Renschler and A. Henning
(extended paper)

RW.2.1 Review on Full Perception Intelligent Pantograph-Catenary System in Electrified Railways

Z. Liu, H. Yang and Y. Song

RW.2.5 Wheel/Rail Adhesion and Coefficient of Friction Measurement using Downscaled Test Rig

G. Jayasree Krishnan, Z. Yang and Z. Li

RW.2.9 Track Management Method Based on In-Service Vehicle Vibration Measurements

H. Tsunashima and T. Nakano

18:15-19:30

Welcome drink reception

Day 2: Monday, 2 September 2024: AM, Room C215

09:00-10:30

Chaired by: James Bell and Zhenxu Sun

Advances in Railway Aerodynamics

organized by: Dr. James Bell, Prof. Guowei Yang, Prof. Zhenxu Sun, Prof. Tiantian Wang and Prof. Tian Li

RW.3.12 Study on Mathematical Model Construction of Typical Gorge Wind Field

G. Yang, J. Cheng, D. Guo and Z. Sun

RW.3.2 Energy Savings for Freight Trains with Aerodynamically Optimized Loading Schemes

A. Buhr, L. Siegel, J. Bell and A. Henning

RW.3.1 Analysis of Flow Structures in Different Loading Gaps of Freight Trains

L. Siegel, A. Buhr, J. Bell and A. Henning

RW.3.3 Numerical Study of Snow Accumulation on Bogies for Long Marshalling High-Speed Trains

Y. Wang, T. Wang, C. Zhao and C. Jiang

RW.3.4 Wind Tunnel Test and Lateral Acceleration Measurement for Application of RTRI's Detailed Equation to Shinkansen

M. Ichiki, T. Ishida and Y. Misu

RW.3.7 Numerical Modelling of Partially Loaded Freight Train Entering a Tunnel

Z. Liu and D. Soper

10:30-11:00: Coffee Break

Day 2: Monday, 2 September 2024: AM, Room C217

09:00-10:30

Chaired by: Alan Facchinetti and Anders Rønquist

Invited Lectures

RW.2.11 Supporting Railway Electrification with Novel Pantograph-Catenary Dynamic Analysis Tools
P. Antunes, J. M. Rebelo, J. Santos, J. Pombo, T. Kemp and M. Whittaker

Pantograph-Catenary Systems

organized by: Prof. Jorge Ambrósio, Dr. Alan Facchinetti, Prof. Anders Rønquist, Dr. Pedro Antunes, Prof. Manuel Tur Valiente, Prof. Zhigang Liu and Prof. Yang Song

RW.4.5 A Model Predictive Controller for Hardware-in-the-Loop Pantograph Test
M. Tur, S. Gregori, P. Antunes, J.P. Santos, A.M. Pedrosa, J. Gil Romero and J. Pombo

RW.4.1 Application of Meta-heuristic Optimization and Gaussian Process Regression to Predict the Performance of a Pantograph-Catenary System
B. Yin, M. Zhang and G. Yang

RW.4.2 Automated Detection of Vegetation Close to Catenary Wires using LiDAR Data
A.-S. Onody, M. Convert, F. Viguier, N. Abdallah, N. Ben Drihem, R. Guerand, J. Sanchez and B. Salavati

RW.4.6 Development of Novel Device to Measure Thickness of Contact Strip and Horn of Pantographs
K. Uemori, H. Kato and T. Narita

10:30-11:00: Coffee Break

Day 2: Monday, 2 September 2024: AM, Room C219

09:00-10:15

Chaired by: Akira Matsumoto and Hideo Nakamura

Railway Accident Analysis and Safety Technologies

organized by: Prof. Akira Matsumoto, Prof. Hideo Nakamura and Dr. Hiroaki Ishida

RW.11.4 Derailment Accident of an Automated Guideway Transit due to Great Earthquake
H. Ishida and K. Ogawa

RW.11.2 Study on a Deterrent against Deer Collisions in Railway Operation Environment
L.C. Lai, K. Shimono, K. Ishii, H. Yokomizo, Y. Suda, T. Iijima, Y. Hatayama, K. Masui and A. Fujita

RW.11.3 Evaluation of Site Amplification Factors on the Seafloor for Use in Earthquake Early Warning for Railways Based on Accumulated Seismic Data
H. Miyakoshi, K. Kinoshita, R. Nakayama, T. Keyaki and K. Kato

RW.11.5 Non-Standard Applications of the IRS 40421 Methodology
L. Cantone

RW.11.11 Freight Train Derailment Severity Estimation using Clustering and Machine Learning Techniques
Z. Saghian and M. Bagheri

10:30-11:00: Coffee Break

Day 2: Monday, 2 September 2024: AM, Room C221

09:00-10:30

Chaired by: Riccardo Parise and Gabriel Himmelbauer

Virtual Coupling and Automatic Train Operations

organized by: Dr. Riccardo Parise

RW.21.4 Virtually Coupled Trains Dynamics and Energy Efficiency: A Simulation-Based Analysis
R. Parise and K. Mullankuzhy

RW.21.1 Development of Positioning Methods for ATO in a Scaled Model Environment
T. Hofmeier, M. Cichon and M. Kleinlein

RW.21.2 Tram Driving Path Identification Systems for Driverless Tram Operations
S. Hovanotayan and K. Nakano

RW.21.6 Conceptual Design of Shunting Automation Elements Utilising the Digital Automatic Coupler
G.S. Himmelbauer, T. Hasenleithner, M. Egger, B. Skok, A. Kaltenbrunner and B. Stadlmann

RW.21.3 Constrained Optimization of Driver Control to Limit Energy Consumption
R. Jorge Do Marco, G. Perrin, C. Funfschilling and C. Soize

RW.21.5 Development, Implementation and Validation of ASC Algorithm for EMU Trains
Y. Buldu, E. Atabay and F. Kaya

10:30-11:00: Coffee Break

Day 2: Monday, 2 September 2024: AM, Room C215

11:00-13:00

Chaired by: Guowei Yang and Tiantian Wang

Advances in Railway Aerodynamics

organized by: Dr. James Bell, Prof. Guowei Yang, Prof. Zhenxu Sun, Prof. Tiantian Wang and Prof. Tian Li

RW.3.5 The Influence of Gaps Between Containers on Pressure Increase Along Freight Trains in Tunnels

J. Bell, A. Henning, R. Volkert, O. Michael, C. Renschler, L. Siegel and A. Buhr

RW.3.6 Evaluation Method of Railway Vehicles' Resistance Against a Tornado-like Vortex

Y. Nagumo and Y. Misu

RW.3.9 Optimization for the Outer Windshield of High-Speed Train Based on Numerical Calculation Method of Dynamic Stability About Fluid-Structure Coupling

Y. Yu, G. Zheng and G. Yang

RW.3.14 Experimental-Numerical Analysis of High-Speed Train Slipstream in Open Air and Confined Spaces

S. Negri, G. Tomasini, P. Schito, D. Rocchi, F.F. Semeraro and C.E. Araya Reyes

RW.3.10 Aerodynamic Characteristics of High-Speed Train Entering and Leaving Tunnel Under Gorge Wind

D. Guo, J. Chen, D. Chen and G. Yang

RW.3.11 Application of Kriging Model with Sequential Infill Criterion on Multi-Objective Optimization of Nose Shape for High-Speed Train

Z. Dai, T. Li, S. Krajnovic and W. Zhang

RW.3.16 Anemometer-Based Approach for Evaluating Overturning Risk Along Railway Lines

G. Crespi, S. Giappino and G. Tomasini

RW.3.13 Large Eddy Simulation of Micro-Riblet Performance Under Upstream Flow Separation

Y. Wang, Z. Sun, S. Ju, D. Guo, B. Yin and G. Yang

12:45-13:45: Lunch

Day 2: Monday, 2 September 2024: AM, Room C217

11:00-13:00

Chaired by: Pedro Antunes and Zhigang Liu

Pantograph-Catenary Systems

organized by: Prof. Jorge Ambrósio, Dr. Alan Facchinetti, Prof. Anders Rønquist, Dr. Pedro Antunes, Prof. Manuel Tur Valiente, Prof. Zhigang Liu and Prof. Yang Song

RW.4.16 A New Methodology for Hybrid Simulation of Pantograph-Catenary Interaction Based on Hybrid System Response Convergence: Proposal and First Numerical and Experimental Tests
L. Calvanese and A. Facchinetti

RW.4.4 Pantograph-Catenary Contact Force Estimation from Linear Camera Images
S. Gregori, M. Tur, A. Correcher, J. Gil Romero, C. Ricolfe-Viala, A.M. Pedrosa and F.J. Fuenmayor

RW.4.12 Review of Perspectives on Pantograph-Catenary Interaction Research for High-Speed Railways Operating at 400 km/h and Above
Y. Song

RW.4.7 Computer Vision-Based Anomaly Detection on Pantograph Carbon Strip
J. Song, K. Xue, K.C. Fung, K.H. Lin, V.T.Y. Ng and K.M. Lam

RW.4.15 Advances in Pantograph and Overhead Line Monitoring in Light Rail
D. Basher, K. Hurst, C. Blackburn and H. Parkinson

RW.4.8 A Robust Contact Force Estimation Method in Pantograph-Catenary System
M. Raisi, A.H. Heidari, S. Maleki, F. Vesali and M. Kolagar

RW.4.9 Implementation of a Virtual Active PID Control in HIL Pantograph Tests
A.M. Pedrosa, M. Tur, N.H. Aldaz, J. Gil Romero, S. Gregori and F.J. Fuenmayor

RW.4.17 Influence of Overhead Line Equipment Irregularities on Pantograph-Catenary Interaction
J. M. Rebelo, P. Antunes, J. Pombo and D. Campbell

12:45-13:45: Lunch

Day 2: Monday, 2 September 2024: AM, Room C219

11:00-13:00

Chaired by: Uday Kumar and Richard Loendersloot

Health Monitoring and Railway Asset Management

organized by: Prof. Uday Kumar, Dr. Richard Loendersloot, Prof. Gareth Tucker, Prof. Matti Rantatalo, Dr. Annemieke Meghoe and Prof. Laurent Bouillaut

RW.7.8 Intelligent Petri Nets Based Maintenance Decision-Making Model Considering RCF Degradation

A. Meghoe, T. Tinga, A. Saleh and M. Chiachío

RW.7.2 Identification of the Lateral Offset of Railway Tracks from Train Accelerations

M. Chihaoui, D. Duhamel, G. Perrin and C. Funfschilling

RW.7.1 Fatigue Crack Damage Detection Using Gaussian Mixture Model Based on Information Entropy Under Time-Varying Temperature

X. Zhang, T. Wang and J. Yang

RW.7.3 Knowledge Structure of Structural Health Monitoring Methods Applied to Railways: A Review Using CiteSpace From 2015-2023

A.C. Pires, A. Antunes Dos Santos and G.F.M.D. Santos

RW.7.4 Dynamic Monitoring in High Speed Railways: A Practical Comparison of Axlebox Accelerations Outliers from Different Train Series

P. Salvador Zuriaga, P. Martínez Fernández, I. Villalba Sanchis and R. Insa Franco

RW.7.5 Performance Analysis of FPGA-Based Extended Kalman Filter for Railway Wheelset Parameters Estimation

K. Mal, B.S. Chowdhry, I.H. Kalwar, T.D. Memon and T.R. Memon

RW.7.6 Design of Innovative Rail Pad Including Removable Sensor for Traffic-Track Monitoring

A. Guillen, M. Sol-Sánchez, O. Guerrero, G. Iglesias, F. Moreno and M.C. Rubio

RW.7.7 A Compact Non-Linear Energy Harvester to an Indirect Wagon Safety Monitoring

M.V. Lopes, P.G. Ramos and A. Antunes Dos Santos

12:45-13:45: Lunch

Day 2: Monday, 2 September 2024: AM, Room C221

11:00-13:15

Chaired by: Leoš Horníček and Jean-François Ferellec

Invited Lectures

RW.2.3 Optimized Sub-Ballast Structure for High-Speed Line with Asphalt Layer and Multiaxial Geogrid

L. Hornicek, Z. Rakowski, J. Pospisil and J. Kawalec

Stabilization of Aggregate Layers in Railway Infrastructure

organized by: Prof. Leoš Horníček, Prof. Erol Tutumluer and Dr. Jacek Kawalec

RW.18.1 Sustainable Sub-Ballast Composed of Recycled Aggregates from Reclaimed Asphalt Road Pavements

M. Sol-Sánchez, O. Guerrero, A. Guillen, F. Moreno and M.C. Rubio

RW.18.2 Assessment of the Bearing Capacity of a Subballast Layer Using a Numerical Model in a Railway Context

O. Jenck, F. Emeriault, M. Dangeard, O.A. Yaba, A. Dhemaied, J.-M. Cornet and A. Schwager-Guillemenet

RW.18.3 The Effects of Different Types of Tamping Operations on the Degradation of Railway Track Geometry

P. Pereira, A. Gay Neto, R. Dos Santos Motta, L. Bariani Bernucci, E. Moura and R. Silva

RW.18.4 Strengthening of CWR Track Stability by Utilising State-of-the-Art Track Bedding Optimisation Technologies

R.W. Zhang, H. Wu and R. Yang

RW.18.5 Performance Evaluation of Single and Double Track Configurations Through 3D Numerical Simulations

M. Perez Diaz, J.M. Mayoral, C. Figueroa, N. Olivera and S. Tepalcapa

RW.18.6 Suppressing Track Lateral Misalignment at High Temperatures by Focusing on Unsupported Sleepers

M. Kusuda

RW.18.7 Design of Geogrid Stabilisation for Railway Ballast and Subballast

F. Trovato and P. Rimoldi

12:45-13:45: Lunch

Day 2: Monday, 2 September 2024: PM, Room C215

14:00-15:45

Chaired by: Weihua Zhang and Karel van Dalen

MAGLEV and Hyperloop Technologies

organized by: Dr Jithu Paul, Jurjen Lohle, Dr. Karel van Dalen, Lorenzo Benedetti, Martijn van Hoorn, Prof. Guobin Lin and Dr. Fei Ni

RW.16.7 A Novel Approach to the Calculation of High-Speed Maglev Traction Force
Y. Jin, F. Ni and X. Wang

RW.16.4 Model Predictive Control of Disturbed Maglev System
M. Liu, S. Fu, H. Wu, X. Liang and X. Zeng

RW.16.1 The Stability Behaviour of an Electromagnetically Suspended Hyperloop Vehicle Subject to Aeroelastic Forcing
J. Paul, A.B. Fărăgău, R.J. van Leijden, A.V. Metrikine and K.N. van Dalen

RW.16.5 Recursive Radial Basis Neural Network-Based Model for Predictive Control of Maglev Vehicles
W. Zhang, H. Wu, S. Fu, X. Liang and X. Zeng

RW.16.6 V-Shaped High-Temperature Superconducting Suspension System for Maglev Train
G. Dovidio

RW.16.8 Development of Fault Diagnosis Equipment for High Speed Maglev Traction Converter System
J. Sun, J. Ma, L. Ju, W. Duan, D. Wang and Z. Zhang

RW.16.9 Development of the Guideway Deviation Measurement Technology for High-Speed Maglev System
Y. Yuan, K. Wang, F. Ye and G. Zeng

16:00-16:30: Coffee break

Day 2: Monday, 2 September 2024: PM, Room C217

14:00-16:00

Chaired by: Anders Rønnquist and Diogo Ribeiro

Invited Lectures

RW.2.8 Train Running Safety on Bridges: Methodologies and Applications
P.A. Montenegro

Railway Bridges

organized by: Prof. Rui Calçada, Prof. José Goicolea, Prof. Anders Rønnquist, Prof. Pedro Museros Romero, Dr. Pedro Montenegro and Prof. Diogo Ribeiro

RW.15.1 Vehicle-Track-Bridge Interaction Effect in the Dynamic Response of Existing Railway Bridges
J.C. Sánchez-Quesada, E. Moliner, A. Romero, P. Galvín and M.D. Martínez-Rodrigo

RW.15.4 Experimental Analysis of the Vertical Track-Bridge Interaction in Railway Bridges with Ballasted Track
A. Stollwitzer and J. Fink

RW.15.5 Validation of the Nonlinear Numerical Model of a Stone Masonry Bridge Under Railway Traffic
R. Silva, D. Ribeiro, C. Costa and A. Arede

RW.15.9 Design of a Scaled Bridge for Validation of Vehicle-Bridge Interaction Models
R. Loendersloot

RW.15.6 Expanding BIM Use in Assessing Fatigue Evolution of Steel Railway Bridges
I.A. Nhamage, C.S. Horas, N.S. Dang, J.A. Campos E Matos, J. Poças Martins and R. Calçada

RW.15.8 New Perspectives on Running Safety in Ballastless Railway Bridges
G. Ferreira, P.A. Montenegro, A.A. Henriques and R. Calçada

16:00-16:30: Coffee break

Day 2: Monday, 2 September 2024: PM, Room C219

14:00-15:30

Chaired by: Simon Barrans and José Sainz-Aja

Innovative Materials and Novel Components for Railway Applications

organized by: Prof. Simon Barrans

RW.20.4 An Adaptable Swivel Button Clamp with Enhanced Fatigue Durability

S.M. Barrans, A. Mccarthy and Z. Fazili

RW.20.2 Optimizing Pearlitic Rail Steel Durability: Low-Temperature Annealing and Nanoscale Carbide Innovations

G. Tressia, L.H. Dias Alves, H. Goldenstein, C.R. Grandini, M. Mohtadi-Bonab and M. Masoumi

RW.20.1 Innovative Concepts for Fatigue-Resistant, Durable and Safe Fixed Railway Tracks in UH-PFRC

A. Hochuli, E. Brühwiler and J.-G. Trouillet

RW.20.3 Assessing the Impact of Thermal Loading from Brake Shoes on Microstructure and Mechanical Properties in Various Railway Wheel Steels: A Comparative Study

L. Ghidini, A. Mazzu and M. Faccoli

RW.20.6 Mechanics and Novel Designs of Polymeric Railway Sleepers in Track Structure

V. Lojda and A. Van Belkom

RW.20.5 Predicting Failure of Tongue Compression End Fittings

S.M. Barrans, M. Newton and C. Greensill

16:00-16:30: Coffee break

Day 2: Monday, 2 September 2024: PM, Room C221

14:00-15:30

Chaired by: Takafumi Koseki and William Zhendong Liu

Railway Operations Planning, Management and Service Optimization

organized by: Prof. Lei Nie

RW.10.1 Short-Term Rainfall Prediction Method Considering Orographic Rainfall for the Train Operation Control

Y. Nakabuchi, T. Shinomiya and E. Nakakita

RW.10.3 A Probabilistic Estimation Method for Station Passenger Flow Based on Railway Network Constraints and Passenger Behavior Model

K. Yamamoto and Y. Konishi

RW.10.4 Simultaneous Optimisation of Energy-Efficient Speed Profiles of Two Trains by Parallel Dynamic Programming

K. Sakai, W. Ohnishi and T. Koseki

RW.10.5 Extended Optimisation of Periodic Urban Train Operation Considering Regenerative Braking Energy Utilisation Between Adjacent Two Trains

X. Meng, W. Ohnishi and T. Koseki

RW.10.6 Decision-Making Model of Urban Rail System for Operation Optimization and System Upgrading

W.Z. Liu, K. Chen, G. Dursun, S. Kapoor, M. Berg, E. Dunkars and J. Forsberg

RW.10.7 Model Refactoring for Spin-Lock Based Resource Sharing: A Case Study for Train Control and Management Software

B.E. Beygo, G. Dayı and K. İmre

16:00-16:30: Coffee break

Day 2: Monday, 2 September 2024: PM, Room C215

16:30-17:45

Chaired by: Lutz Auersch-Saworski and Kazuhisa Abe

Railway Noise and Vibration

organized by: Dr. Michael Steenbergen and Prof. Geert Degrande

RW.13.2 The Excitation, Propagation and Mitigation of Train-Induced Ground Vibrations from the Axle Impulses on the Track

L. Auersch, L. Conreux, S. Said and R. Müller

RW.13.3 Noise Characteristics and Noise Control of a Suspended Aerial Rail Train

S. Ding, D. Chen, Y. Zhao, Y. Yu and J. Du

RW.13.4 Prediction and Control Cabin Noise of High Speed Train

Y.J. Zhao, D.W. Chen, J. Du, Y.H. Yu, S.K. Song, R.M. Wu and H.W. Chen

RW.13.5 Stochastic Track Vibration Analysis in Consideration of Log-Normal Type Spatial Variation of Rail Material Parameters and Shape Dimensions

K. Koro, K. Suzuki and K. Abe

RW.13.6 Train-Induced Indoor Secondary Vibration Study and Control Over-Track Buildings in a Subway Transfer Station

Y. Sun and M. Xing

Day 2: Monday, 2 September 2024: PM, Room C217

16:30-17:45

Chaired by: Pedro Montenegro and Prof. Diogo Ribeiro

Invited Lectures

RW.2.7 Vehicle-Bridge Interaction and Structural Health Monitoring for Bridge Asset Management
R. Loendersloot

Railway Bridges

organized by: Prof. Rui Calçada, Prof. José Goicolea, Prof. Anders Rønnquist, Prof. Pedro Museros Romero, Dr. Pedro Montenegro and Prof. Diogo Ribeiro

RW.15.2 On the Dynamic Response of Soil-Structure Coupled Railway Infrastructures: The Case of a Portal Frame Bridge
J. Chordà Monsonís, J.C. Sánchez-Quesada, E. Moliner, A. Romero, P. Galvín and M.D. Martínez-Rodrigo

RW.15.3 Damping Assessment on Railway Bridges Based on an Extensive Experimental Database Framed on the InBridge4EU Project
P.A. Montenegro, R. Silva, F. Pimenta, E. Lalignat, C. Dos Santos and C. Laurent

RW.15.7 Drive-By Early Damage Detection in Railway Bridges using Wavelets and Autoencoders
C. Braganca, E.D. De Souza, D. Ribeiro and T. Bittencourt

Day 2: Monday, 2 September 2024: PM, Room C219

16:30-17:30

Chaired by: Aaron Paz Martinez and Takafumi Koseki

Railway Economics, Inter-Modal Traffic, Terminals and Logistics

organized by: Dr. Armando Carrillo, Prof. Nebojsa Bojovic and Dr. Milos Milenkovic

RW.27.2 Assessing Multimodal Mobility Systems for Benchmarking Rail-Bound Intermodal Pods in ERJU's FA7-Projekt Pods4Rail

A. Paz Martinez, Y.K. Adams, S. Nägele, V. Laqua and D. Winkler

RW.27.1 The Contribution of Town Functions and Services to Station Congestion Levelling

Y. Soda and Y. Yoshihara

Railway Signalling and Safety

organized by: Dr. Xiaocheng Ge, Prof. Pradip Ray, Prof. Coen Van Gulijk and Prof. Subhash Panja

RW.26.1 A Simulation Environment for Moving Block Signalling Systems

M. Barbaro, I. La Paglia, L. Bernardini, G. Bucca, R. Corradi, A. Collina and M. Boccione

RW.26.2 Proposal of a Train Localisation Method Based on the Addition of Cubic Code

K. Nagai, W. Ohnishi and T. Koseki

Day 2: Monday, 2 September 2024: PM, Room C221

16:30-17:45

Chaired by: Rahul Reddy Banapuram and Leiv Jørgen Husøy

Trackbed Design and Maintenance

organized by: Prof. Guoqing Jing and Prof. Mingjing Fang

RW.24.1 Non-Uniform Expansion Characteristics of Red Beds in the Sichuan Basin, China: Implications for Uplift Mechanisms in High-Speed Railway Subgrade

F. Yu, J. Li, Z. Dai and S. Chen

RW.24.2 Engineering Rapid Hardening Repair Mortar for Ballast-Less Track Maintenance

R.R. Banapuram, K.K. Kuna, A.R. Muppireddy and A. Deb

RW.24.3 A Review of Current Ballast Bed Assessment Practices Across the Nordic Countries

L.J. Husøy, A. Lau, A.H. Løhren and I. Hoff

RW.24.4 DEM Analysis of Lateral Sleeper Resistance: Effect of Sleeper-Ballast Interaction and Aggregate Friction

C. Shi, A. Andersson, L. Xu and J. Guo

Axle Bearing Monitoring and Bearing Technologies

organized by: Prof. Fengshou Gu, Dr. Bingham Chen and Dr. Cai Yi

RW.28.1 Varying Speed Diagnosis of High Speed Train Bogie Rolling Bearing: Real Train Experiment, Comparison and Prediction of Transfer Learning Performance

B. Yang, T. Wang and J. Xie

Day 3: Tuesday, 3 September 2024: AM, Room C215

09:00-10:15

Chaired by: Karel van Dalen and Fei Ni

MAGLEV and Hyperloop Technologies

organized by: Dr Jithu Paul, Jurjen Lohle, Dr. Karel van Dalen, Lorenzo Benedetti, Martijn van Hoorn, Prof. Guobin Lin and Dr. Fei Ni

RW.16.10 Research on the Modeling of Magnetic-Track Relations and Dynamic Performance of Superconducting Maglev Vehicle

J. Yang, S. Liu, J. Zhao, L. Dong and T. Han

RW.16.2 Investigation of Hyperloop Skeleton Tube Design

L. Ekart

RW.16.12 Feasibility Study on the Medium-Low-Speed Maglev Power Supply of DC 3-kV System Considering Train Acceleration

K. Huang

RW.16.3 Identifying the Separate Contributions of Electromagnetic and Wave-Induced Instability Mechanisms to the Overall Dynamic Instability in Hyperloop and Maglev Systems

A.B. Fărăgău, A.V. Metrikine, K.N. van Dalen, J. Paul and R.J. Van Leijden

RW.16.11 Research on the Characteristic of Ultra-High Speed Linear Motor

Y. Hu, G. Lin, Z. Long and X. Ma

10:30-11:00: Coffee Break

Day 3: Tuesday, 3 September 2024: AM, Room C217

09:00-10:30

Chaired by: Simon Iwnicki and Hugo Magalhães

Railway Dynamics and Vehicle-Track Interaction

organized by: Prof. Yoshihiro Suda, Prof. Simon Iwnicki, Dr. Enrico Meli, Prof. José Escalona and Dr. Hugo Magalhães

RW.5.4 Impact of Contact Geometry, Rail and Wheelset Structural Dynamics on the Dynamic Behaviour on an Irregular Track

I. Kaiser, F. Badea Romero, J.Á. Pérez Fernández, S. Strano, M. Terzo and C. Tordela

RW.5.10 Study on the Mechanism of Wheelset Angular Velocity Changing on Curved Tracks

Y. Endo, Y. Michitsuji, M. Tanimoto and O. Imahori

RW.5.6 Study of the Possibility of Railway Transportation of Tracked Vehicles in an Open Wagon

J. Gerlici, A. Lovska, J. Dižo and M. Blatnický

RW.5.1 Preliminary Performance Test of Active Secondary Vertical Suspension using a Low Power Actuator on a Railway Roller Rig

Y. Sugahara

RW.5.2 Analysis of the Load of a Passenger Car Frame equipped with a New Concept for an Automatic Coupler

A. Lovska, J. Gerlici, J. Dižo and V. Ishchuk

RW.5.3 Coupled Dynamic Modeling of Car Body and Underchassis Equipment Considering the Dynamic Evolution Characteristics of Rubber Elements

X. Deng and D. Gong

10:30-11:00: Coffee Break

Day 3: Tuesday, 3 September 2024: AM, Room C219

09:00-10:30

Chaired by: Howard Parkinson and Johan Nordlander

Invited Lectures

Towards FP10, Academic networks in European Rail Research; EURNEX, Academics4Rail, PhDs EU-Rail, ERRAC PAG Academia and Rail Research Innovation Agenda,
A. Carrillo Zanuy

Future Trends in Railway Transport

organized by: Dr. Howard Parkinson

RW.25.1 Docking trains: A Comparison
P.J. Nordlander

RW.25.3 A Structured Standardization-Oriented Approach to Modular Railway Monitorization
J. Fernandes, F. Boavida and M. Curado

RW.25.2 Transform Traditional Trains to Linear Docking and Save Significant Time
J. Nordlander

10:30-11:00: Coffee Break

Day 3: Tuesday, 3 September 2024: AM, Room C221

09:00-10:45

Chaired by: Takumi Fukuda and Stephen Lloyd

Railway Operations Planning, Management and Service Optimization

organized by: Prof. Lei Nie

RW.10.8 Management and Modeling in Transport Systems using Self-Organization

V. Samsonkin, O. Yurchenko and V. Druz

RW.10.9 An Examination of Machine Learning Methods for Predicting Station Departure Delay Time Based on Historical Train Traffic Records

T. Fukuda, S. Takahashi and H. Nakamura

RW.10.10 Simulating Solar Radiation on Railway Networks using Free and Open-Source Tools

Y. Boussad, A. Tomlinson, Y. Yang, S. Grant-Muller, C. Noakes, J.-A. Pattinson and K.-A. Moseley

RW.10.11 Construction of Emergency Management System for Rail Transit Operation Safety under Network Integration Conditions

S. Hong, J. Zang, Z. Wang and S. Wu

RW.10.12 New Thoughts on China's Iron Silk Road

S. Lloyd and W. Atteridge

RW.10.13 The Application of Common Safety Method to Evaluate Migration to Autonomous Railway Operation - Discussion

M. Matowicki and A. Torun

RW.10.2 System Architecture for a Data-Based, Automated ETCS L2 Data Point Plan Review

S. Vogel, C. Steinbach, A. Crespo Materna and A. Oetting

10:30-11:00: Coffee Break

Day 3: Tuesday, 3 September 2024: AM, Room C215

11:00-12:45

Chaired by: Guowei Yang and James Bell

Advances in Railway Aerodynamics

organized by: Dr. James Bell, Prof. Guowei Yang, Prof. Zhenxu Sun, Prof. Tiantian Wang and Prof. Tian Li

RW.3.8 Investigation of Critical Tunnel Length Based on the Maximum Positive Pressure on the Trailing Carriage of a High-Speed Train

Z. Sun, K. Nan, D. Guo and G. Yang

RW.3.15 Comparative Analysis of Different Models To Estimate the Internal Pressure of a Railway Vehicle Based on Experimental Data

F. Moro, C. Somaschini and D. Rocchi

RW.3.17 Dynamic Modelling of the Aerodynamic Characteristics of a 600km/h High-Speed Magnetic Levitation Train Traversing a Tunnel

S. Xu and L. Zhang

RW.3.18 Analysis of Aerodynamic Characteristics for High-Speed Maglev Train Operating Inside Tunnels at 600 km/h

S. Pan, L. Zhang, T. Lin, S. Xu and Y. Gao

RW.3.20 Aerodynamics of Freight Trains: An Open Database of Geometries for CFD Analyses

L. Corniani, P. Schito and S. Bruni

RW.3.19 Research on the Influence of Cross Passage on High-speed Maglev Train Pressure Waves in Tunnels

S. Fu, J. Du, J. Du and G. Li

RW.3.21 Influence of Strong Wind on the Aerodynamic Characteristics of the High-Speed Maglev Train

J. Sun, M.-Z. Yang, L. Zhang, W.-X. Teng and G. Chen

12:45-13:45: Lunch

Day 3: Tuesday, 3 September 2024: AM, Room C217

11:00-12:45

Chaired by: Yoshihiro Suda and Ingo Kaiser

Invited Lectures

RW.2.10 Detailed Contact Geometry Processing for 3D Wheel and Rail Surfaces
E. Vollebregt

Railway Dynamics and Vehicle-Track Interaction

organized by: Prof. Yoshihiro Suda, Prof. Simon Iwnicki, Dr. Enrico Meli, Prof. José Escalona and Dr. Hugo Magalhães

RW.5.12 Integrating Longitudinal Train Dynamics Simulations Within Multibody Models
N. Bosso, A. Gugliotta, M. Magelli and N. Zampieri

RW.5.5 Optimization of Primary Suspension of Freight Wagons to Improve Wheel Wear and Rolling Contact Fatigue
C. Suque Endlich, M. Valente Lopes, P. Augusto De Paula Pacheco and A. Antunes Dos Santos

RW.5.7 Improving Ride Comfort of Railway Vehicles on High-Speed Tracks Using Model Predictive Control
A. Posseckert

RW.5.14 Derailment Risk Assessment of a Freight Wagon due to Cyclic Top
H. Magalhães, C. Correa, V. Infante and J. Pagaimo

RW.5.8 Combined Structural and Multibody Optimization of Railway Vehicle Components: Application to a Railway Bogie
A. Cascino, E. Meli and A. Rindi

12:45-13:45: Lunch

Day 3: Tuesday, 3 September 2024: AM, Room C219

11:00-13:00

Chaired by: Hitoshi Tsunashima and Annemieke Meghoe

Health Monitoring and Railway Asset Management

organized by: Prof. Uday Kumar, Dr. Richard Loendersloot, Prof. Gareth Tucker, Prof. Matti Rantatalo, Dr. Annemieke Meghoe and Prof. Laurent Bouillaut

RW.7.16 Design of a Modular and Integrated On-Board System for Freight Train Condition Monitoring
F. Zanelli, A. Galimberti, N. Debattisti, M. Mauri, D. Tarsitano, C. Osorio Mendoza, S. Negri and G. Tomasini

RW.7.13 Smart Rail Infrastructure: Onboard Monitoring with Machine Learning for Track Defect Detection
A. Mosleh, M. Mohammadi, C. Canduco, D. Ribeiro, C. Vale, A. Meixedo and P.A. Montenegro

RW.7.9 On the Possibilities of Using Classical Hot-Box Detectors as Condition Monitoring Systems
F. Thiery, P. Chandran and M. Rantatalo

RW.7.10 On Wayside Detector Measurement of Wheel-Rail Impact Loads Induced by Wheel Flats - Data Analysis, Alarm Levels and Regulations
K. Mattsson, J.C.O. Nielsen, L. Fehrlund, M. Maglio and T. Vernersson

RW.7.11 Multiple Wheel Flat Identification in a Freight Train Through Track-Side Monitoring System
M. Mohammadi, A. Mosleh, C. Vale, D. Ribeiro, P.A. Montenegro and A. Meixedo

RW.7.12 AI-Powered Singular Point Detection for Improved Energy Efficiency
R. Kour, N. Venkatesh, P. Dersin, V. Jägare, R. Karim, F. Le Corre and H. Jarl

RW.7.14 Data-Driven Approach for Condition-Based Maintenance of Freight Train Wheelsets using Markov Decision Process
A.S. Bhadouria, J.A.P. Braga, R.P. Mishra and A.R. Andrade

RW.7.15 Smart Autonomous Diagnostics of Switches and Crossings
L. Raif, O. Plášek, M. Kohout, V. Salajka, J. Podroužek, J. Vágner, A. Hába, P. Navrátil, M. Vyhlídal, I. Vukušič, R. Krč and Z. Hadaš

12:45-13:45: Lunch

Day 3: Tuesday, 3 September 2024: AM, Room C221

11:00-12:45

Chaired by: Karel van Dalen and Rosario Chamorro

Track Stiffness and Transition Zones

organized by: Prof. Yann Bezin, Dr. José Varandas and Dr. Karel van Dalen

RW.17.1 Evaluation of a Novel Mitigation Measure for Two Different Types of Railway Transition Zones.

A. Jain, A.V. Metrikine, M.J.M.M. Steenbergen and K.N. van Dalen

RW.17.2 Influence of Sleeper Base Area and Spacing on Long-Term Differential Settlement in a Railway Track Transition Zone

K. Nasrollahi and J. Nielsen

RW.17.3 Rail Vehicle-Track Interaction in Bridge Transition Zone using Multibody-Dynamic Approach

P. Gorai, S.K. Saha, R.K. K, S. Panda and B. Manna

RW.17.4 Response Amplification at Railway Transition Zones - Comparison of Soft-to-Stiff and Stiff-to-Soft Transitions

A.B. Fărăgău, A.V. Metrikine and K.N. van Dalen

RW.17.5 Performance of a Ballastless Track in a Transition Zone and the Influence of the Train Speed

A. Ramos, A. Gomes Correia and R. Calçada

RW.17.6 Simulation of Dynamic Interaction and Long-Term Processes of Void Accumulation in Ballast Layer

O. Nabochenko, M. Sysyn and M. Unger

RW.17.7 Analysis of the Periodic Orbit in a Discretely Supported Railway Track Under a Moving Load

R. Chamorro, A. Brazales, J.F. Aceituno and J.L. Escalona

12:45-13:45: Lunch

Day 3: Tuesday, 3 September 2024: PM, Room C215

14:00-15:30

Chaired by: Akira Matsumoto and Hiroaki Ishida

Railway Accident Analysis and Safety Technologies

organized by: Prof. Akira Matsumoto, Prof. Hideo Nakamura and Dr. Hiroaki Ishida

RW.11.1 A Study for the Installation of a Door Catch Detection Device using a Laser Sensor
R. Watanabe, Y. Akasaka, Y. Uchida, K. Matsuhashi and Y. Misu

RW.11.10 Assessment of Safety Against Derailment using Simulations and the Simplified Method of EN 14363 Standard
A. Guedes, R. Silva, V. Gonçalves, F. Manso, A. Meixedo, P.A. Montenegro and J.T. Fernandes

RW.11.6 Obstacle Detection using Camera and LiDAR for Train Forward Surveillance
R. Kageyama

RW.11.8 Changes in the Number of Natural Disaster on Japanese Railway Under Global Warming
H. Suzuki and S. Uemura

RW.11.9 Analysing Railway Accidents: A Statistical Approach to Evaluating Human Performance in Obstacle Detection
O. Lahneche, A. Haag, P. Dendorfer, V. Aravatinos, M. Guilbert and M. Sallak

RW.11.7 Application of Systemic Thinking to Learn Safety Culture and Human Reliability Perspectives in Freight Train Derailments
H. Peng, G. Tucker and C. Watson

16:00-16:30: Coffee break

Day 3: Tuesday, 3 September 2024: PM, Room C217

14:00-16:15

Chaired by: Nicola Bosso and Auteliano Santos Jr.

Invited Lectures

Translating Rolling Stock Research into Practice
S. Iwnicki

Wheel-Rail Interaction: Tribology, Degradation, Monitoring, Maintenance, Modelling and Validation

organized by: Dr. Michaël Steenbergen, Prof. Auteliano Santos Jr. and Prof. Nicola Bosso

RW.9.1 Roller Rig for Wheel-Rail Wear Investigations Using Thermal Imaging
T. Staśkiewicz, P. Pawłowski, B. Firlik and M. Słowiński

RW.9.8 An Innovative Wheel Wear Model to Study the Profiles Evolution in Presence of Conformal Contact Conditions
L. Nencioni, E. Meli, A. Rindi and Z. Shi

RW.9.2 The Effect of the Calculation of Slip Speed on the Wear of Wheel Profiles: A Benchmarking Against the SIMPACK Wheel Profile Wear Module
M. Magelli, N. Zampieri and N. Bosso

RW.9.12 Combination of Longitudinal Train Dynamics and Multibody Simulation: Comparison of Co-Simulation with Other Modelling Strategies
P.H. Alves Correa, M. Magelli, A.A. Santos Jr and N. Bosso

RW.9.3 Dynamics-Based Estimation of Wheel-Rail Friction Coefficient using Deep CNN
B. Abduraxman, P. Hubbard, T. Harrison, C. Ward, D. Fletcher, R. Lewis, K. Chandrasekhar and D. Vincent

RW.9.4 Surface Damage Assessment in Rail and Wheel Steels Using an Innovative Vision System
A. Mazzu, I. Bodini, N. Zani, L. Ghidini, C. Petrogalli, S. Bonometti, G. Coffetti and D. Palandi

RW.9.5 Optimizing Wear Prediction Models for High-Speed Railway: A Numerical Sensitivity Analysis
Z. Shi, E. Meli, Y. Sun and A. Rindi

16:00-16:30: Coffee break

Day 3: Tuesday, 3 September 2024: PM, Room C219

14:00-16:15

Chaired by: Bjorn Pålsson and Andrea Bracciali

Switches and Crossings Developments

organized by: Prof. Yann Bezin and Prof. Björn Pålsson

RW.6.15 Prediction of long-term damage evolution in crossing panels using an iterative simulation scheme

B.A. Pålsson and U. Ossberger

RW.6.4 Minimization of Impact Forces on Crossings by Railhead Profile Optimization

G. Megna and A. Bracciali

RW.6.1 Rail Switching Device for Turnout using Electrohydraulic Actuator and its Performance Tests

S. Tamagawa, S. Shimizu and S. Yasuda

RW.6.2 Evaluation of ballast loading in a crossing

S. Gapp, D. Samardzic, J. Maierhofer, W. Daves, M. Pötz and C. Ebner-Mürzl

RW.6.9 Research on Dynamic Performance of No.18 Turnout of Passenger Dedicated Line at 400 km/h

B. Hou, Y. Zhu, D. Wang and J. Pombo

RW.6.3 Dynamic Measurement of Switch & Crossing Geometry

R. Acosta Suñé, P. Fisetete and N. Docquier

RW.6.5 Dynamic Behaviour Comparison of a Switch Panel with Independently Modelled Rails Versus Combined Rails

A. Astiazaran, B. Rodriguez-Arana, A. San Emeterio and J. Nieto

RW.6.6 Processing Rail Crossing Geometries: From 3D Mesh to Cross-Section Profiles

S. Antia-Vallecillo, N. Gil-Negrete, B. Rodriguez-Arana, J. Nieto and E. Fustes

RW.6.7 Calibrated Superstructure Model for Ballast Condition Monitoring in Turnouts

G. Prinz, J. Fuchs and B. Lubert

16:00-16:30: Coffee break

Day 3: Tuesday, 3 September 2024: PM, Room C221

14:00-15:45

Chaired by: Luca Pugi and Benjamin Ebrecht

Alternative Power Supply and Sustainable Rail Transport

organized by: Dr. Luca Pugi and Prof. Qing Wu

RW.12.9 Laboratory and Field Evaluation of an Energy Harvesting Tie for Energy Generation on Rail-road Tracks

M. Ahmadian, Y. Chen and Y. Pan

RW.12.2 Learning from Battery Train Projects for Retrofitting Diesel Trainsets in Cuba

B. Ebrecht

RW.12.1 Energy Harvesting in High-Speed Railway Bridges Using Magnetoelastic Materials

J.C. Cámara-Molina, A. Romero, P. Galvín, P. Marín, M.D. Martínez-Rodrigo and E. Moliner

RW.12.3 Limitations in the Hydrogen Refueling Process of Railway Vehicles

S. Wieser, L. Brünner, M. Böhm, F. Heckert, S. Rubio and M. Soto

RW.12.5 The Integration of Innovative Power Sources and Storage Systems in the Railway Sector: A Brief Perspective Analysis

L. Pugi, A. Kociu, L. Berzi, L. Di Carlo and M. Delogu

RW.12.4 Power Forecast of Overhead Catenary Islands in Battery Electric Train Operation: Case Study of Pfalznetz

S. Herwartz-Polster, J. Pagenkopf, J. Kaiser and M. Freienhofer

RW.12.6 Research Methods on Reducing Power Consumption Through Big Data Analysis in the Railway Field

T. Fujimasu, D. Horikoshi, M. Yoshizawa, M. Adachi, H. Moriyama and A. Hibino

16:00-16:30: Coffee break

Day 3: Tuesday, 3 September 2024: PM, Room C215

16:30-17:45

Chaired by: Manuel Tur and Yang Song

Pantograph-Catenary Systems

organized by: Prof. Jorge Ambrósio, Dr. Alan Facchinetti, Prof. Anders Rønquist, Dr. Pedro Antunes, Prof. Manuel Tur Valiente, Prof. Zhigang Liu and Prof. Yang Song

RW.4.3 The Relevance of Non-Linear Dynamics on Railway Pantographs

J. Gil Romero, S. Gregori, M. Tur and F.J. Fuenmayor

RW.4.10 A Simplified Modal Superposition Method Based Pantograph-Stitched Catenary Interaction Model

Y. Xu, H. Li, J. Lei and W.Z. Liu

RW.4.11 Convergence Study for the Simulation of Stitched Railway Catenary Dynamics and Design Verification of a High-Speed System for Sweden

B. Schick, W.Z. Liu and S. Stichel

RW.4.13 Study of Load Spectrum Distribution by Non-Parametric Fitting Method of High-Speed Pantograph

H. Wei, N. Zhou and X. Zhi

RW.4.14 Continuous Fault Injection for Pantographs of High-Speed Trains Based on AMESim and Python

T. Xia, J. Ding, J. Zuo and Y. Pan

Day 3: Tuesday, 3 September 2024: PM, Room C217

16:30-17:30

Chaired by: Zili Li and Hugo Magalhães

Wheel-Rail Contact Mechanics and Related Problems

organized by: Prof. Zili Li, Prof. Ernesto Garcia and Dr. Zhen Yang

RW.22.1 Study on the Significant Influencing Factors on Vehicle Operational Stability in Large-Size Turnout Areas

Y. Li, Y. Qian, Z. Liu, J. Xu, R. Chen and Y. Luo

RW.22.2 Development of an Extended Kalman Filter for Determination of the Normal Wheel-Rail Contact Force

B. De Leeuw, Z. Yang and Z. Li

RW.22.3 A PDEM-Based Research on the Impact of Stochasticity in the Inside Distance Between the Wheelset on the Vehicle-Turnout Coupling System

Z. Yan, T. Li, J. Chen, J. Xu, P. Wang and R. Chen

RW.22.4 Predicting Wheel Slippage in Railways using Bidirectional Recurrent Neural Networks

J.C. Jauregui-Correa, J. Rodríguez-Resendis, M. Romo-Aviles, L. Morales-Velazquez, G. Hurtado-Hurtado and T. Sandoval-Valencia

Day 3: Tuesday, 3 September 2024: PM, Room C219

16:30-18:00

Chaired by: Stephen Barber and Yujin Lim

Railway Infrastructure Maintenance and Inspection

organized by: Dr. Brian Counter and Dr. Stephen Barber

RW.19.6 Advanced Measurement of Railway Track Layer Deformations using a Combined Multi-Depth Deflectometer and Global Navigation Satellite System Technique

Y. Lim, P. Bahati and V. Le

RW.19.1 Rating-Based Design of a Vehicle for Herbicide-Free Vegetation Control on Rails

N. Jendry, C. Archut, A. Schulte-Marxloh, M. Eberius, U. Conrath and C. Schindler

RW.19.4 A Methodology for Track Geometry Estimation using Inertial Measurements: Compensation of Bogie Filtering

C.E. Araya Reyes, I. La Paglia, E. Di Gialleonardo, A. Facchinetti and S. Bruni

RW.19.2 An Evaluation of the Potential Use of Ballast Tampers for Dynamic Track Monitoring

P. Martínez Fernández, I. Villalba Sanchis, P. Salvador Zuriaga and R. Insa Franco

RW.19.5 An Application of the Unknown Input Observer Algorithm for the Identification of Vertical Railway Track Irregularity

I. La Paglia, M. Santelia, S. Alfi, E. Di Gialleonardo and A. Facchinetti

RW.19.3 A Comprehensive Study with Scenario, Barrier Description and Human Reliability Assessment to Evaluate Freight Train Derailments

H. Peng

Day 3: Tuesday, 3 September 2024: PM, Room C221

16:30-18:00

Chaired by: Lutz Auersch-Saworski and Zuzana Dimitrovová

Railway Noise and Vibration

organized by: Dr. Michael Steenbergen and Prof. Geert Degrande

RW.13.1 Numerical Evaluation of Wave Energy Radiated from a Tunnel due to Bogie-Track Interaction
K. Abe and K. Sato

RW.13.7 Rubber Modified Ballasted Track Systems for Low Noise and Low Vibration
S.R. Karumanchi, S. Lenart, Y. Ghafoori and D. Garcia Sanchez

RW.13.8 Performance Comparison of the Forward and Inverse Metawedge for Ground-Borne Vibration Mitigation
A.B. Fărăgău, S. Van Gaal, E. Vlijm, A.V. Metrikine, A. Tsouvalas and K.N. van Dalen

Vibration Analysis of Moving Load Problems

organized by: Prof. Piotr Koziol and Prof. Zuzana Dimitrovová

RW.29.1 Analysis of the Negative Effect of High Damping on the Instability of Moving Inertial Objects
Z. Dimitrovová

Railway Noise and Vibration

organized by: Dr. Michael Steenbergen and Prof. Geert Degrande

RW.13.9 The Influence of Wheel/Rail Contact Conditions on Curve Squeal Noise: Experimental and Numerical Investigation
F. Castellini, L. Faccini, S. Alfi, E. Di Gialleonardo, R. Corradi, G. Squicciarini and D. Thompson

RW.13.10 An Experimental Methodology for the Assessment of Ground-Borne Vibrations due to Railway Vehicles
L. Faccini, F. Castellini, E. Di Gialleonardo, S. Alfi, S. Bionda and R. Corradi

Day 4: Wednesday, 4 September 2024: AM, Room C215

09:00-10:45

Chaired by: Zhigang Liu and Isidro Durazo-Cardenas

Smart Technologies, Digital Twins and Artificial Intelligence for Railway Asset Management

organized by: Dr. Hongrui Wang, Dr. Alfredo Núñez Vicencio, Prof. Zhigang Liu, Dr. Isidro Durazo-Cardenas and Burchard Ripke

RW.8.15 Demonstration of smart autonomous AI ultrasonic inspections to TRL 7

I. Durazo-Cardenas

RW.8.9 Reliability and Performance Improvement Through AI: A Case Study of Sleeper Train Fleet Critical Systems

B. Alkali and C.F. Nworah

RW.8.13 Machine Learning-Based Parametric Analysis of Railway Systems

J.A. Sainz-Aja, D. Ferreño, J. Pombo, I. Carrascal, J. Casado, S. Diego, J. Castro and I. Rivas

RW.8.1 Maintenance Applications of a Machine Learning Model of Rail Defects

O. Vo Van and V. Laurent

RW.8.2 Intelligent and Convenient Detection of Micrometer-Scale Rail Corrugation

X. Tang, X. Cai, Y. Wang, H. Peng and Y. Hou

RW.8.3 Design of an Integrated Monitoring System for Multiple-Unit Freight Trains

S. Gurri, G. Zara, A. Di Paola and B. Dalla Chiara

RW.8.4 Automating Multi-Analytical Tasks in Machine-Vision Enabled Rail Surface Inspections: A Three-Stage Deep Learning Based Method

T. Wang

10:30-11:00: Coffee Break

Day 4: Wednesday, 4 September 2024: AM, Room C217

09:00-10:30

Chaired by: Enrico Meli and Hugo Magalhães

Railway Dynamics and Vehicle-Track Interaction

organized by: Prof. Yoshihiro Suda, Prof. Simon Iwnicki, Dr. Enrico Meli, Prof. José Escalona and Dr. Hugo Magalhães

RW.5.9 An Innovative Framework for the Simulation of Longitudinal Dynamics for Long Freight Trains
L. Lanzillo, F. Mazzeo, S. Melzi, L. Nencioni and E. Meli

RW.5.16 Semi-Active Damping System for Secondary Suspension of Electric Multiple Unit
T. Michálek, F. Jeniš, Z. Strecker, I. Mazůrek, O. Macháček, P. Staněk, Z. Malkovský and J. Chvojan

RW.5.11 Experimental Investigation of the Track Dynamic Performance for a Downslope Small-Radius Curve in a Metro
X. Liu, H. Jiang, Y. Chen and M. Gao

RW.5.13 Dynamic Analysis of a Ballast-Less Railway Track Through a Periodically Supported Timoshenko Beam and Dynamical Forces Consideration
D. Gonzalez Velasco, D. Duhamel, T. Hoang, G. Foret, H. Lenglin and B. Findinier

RW.5.15 Studies on Track Irregularity Limit Values of Heavy Haul Railway Under Sensitive Wavelength
T. Xin, C. Kong, C. Li and L. Sun

RW.5.17 Calculation of the Influence of the Track System on the Dynamic Behaviour of a Rolling Wheelset using a Finite Element Model
R. Benkreif, W. Daves and J. Maierhofer

10:30-11:00: Coffee Break

Day 4: Wednesday, 4 September 2024: AM, Room C219

09:00-10:30

Chaired by: Mehdi Ahmadian and Nicolò Zampieri

Traction and Braking: Control, Safety and Energy Recovery

organized by: Prof. Jianyong Zuo, Prof. Nicolò Zampieri, Dr. Yu Pan and Dr. Jingxian Ding

RW.14.1 Reduction Technique for Braking Distance of Railway Vehicles via Dry Air Jetting
D. Yamamoto

RW.14.2 Coordinated Control of Multiple Wayside Energy Storage Systems Based on Fuzzy Logic Algorithm
J. Mi, K. Sun, Z. Yang, F. Lin and Z. Zhong

RW.14.3 A Power Electronic Transformer for Rail Vehicles Based on SiC
J. Qu, Y. Zhang, X. Gao, J. Ma and Y. Lei

RW.14.4 Network Theory Approach to Analysing Knock-On Effects in Rail Vehicle Design
S.K. Abburu, C. Casanueva and C.J. O'Reilly

RW.14.5 Research on Consistency-Based Matchability Evaluation Method for Brake Valves of Heavy-Duty Trains
X. Wu, J. Ding, J. Zuo and Y. Pan

RW.14.6 Comparison of Heat Dissipation Characteristics Between Carbon Ceramic Brake Disc and Steel Brake Disc
S. Zheng, J. Zuo, J. Ding, G. Chen and Y. Pan

10:30-11:00: Coffee Break

Day 4: Wednesday, 4 September 2024: AM, Room C221

09:00-10:30

Chaired by: Yohei Michitsuji and Araliya Mosleh

Invited Lectures

RW.2.6 Challenges for Heavy Haul Rail Transportation in Brazil: A Safety and Environmental Perspective

A.A. Santos Jr, L. Fraga Guimarães, J. Santos, A. Mandelli and L. Fernandes Nunes

Resilient and Efficient Railway Services

organized by: Prof. Lingyun Meng and Prof. Xiaojie Luan

RW.23.1 Waste of Pellet Feed in Water Drainage Using Scale-Down Bench Testing

G. Alcalá Tabata, J.B. Cyrino Florence, L.H. Fernandes De Albuquerque, D. De Morais Júnior, V. Da Silva Rosa and F. Bertelli

RW.23.4 CyRail: Enhancing Cybersecurity in Railway Operational Technology Through an Innovative Software Assistant

R. Bolton, D. Basher, S. Parkinson and H. Parkinson

RW.23.2 Compaction of Dry Sinter and Pellet Feed in Experimental Bench and Electromagnetic Shaker

J.B. Cyrino Florence, G. Alcalá Tabata, L.H. Fernandes De Albuquerque, D. De Morais Júnior, V. Da Silva Rosa and F. Bertelli

RW.23.3 Railway Material Forecasting With Particle Swarm Optimization-Based Neural Network

Z. Huang, X. Cai, R. Jin, J. Sun, F. Wang, B. Liu and M. Dai

10:30-11:00: Coffee Break

Day 4: Wednesday, 4 September 2024: AM, Room C215

11:00-13:00

Chaired by: Isidro Durazo-Cardenas and Babakalli Alkali

Smart Technologies, Digital Twins and Artificial Intelligence for Railway Asset Management

organized by: Dr. Hongrui Wang, Dr. Alfredo Núñez Vicencio, Prof. Zhigang Liu, Dr. Isidro Durazo-Cardenas and Burchard Ripke

RW.8.5 Technical Assessment of a Rail Profile Measurement System by Big Data Analysis Model & Processing

R.W. Zhang, H. Wu and R. Yang

RW.8.14 A Generic and Original Data Model Based on Real World Return of Experience to Support Innovative Tools for Predictive Maintenance

S. Chaumette and J. Ouoba

RW.8.6 Cordel's Approach to Revolutionise the Management of 'Track Geometry' and 'Vehicle Response' Monitoring by Exploiting AI and ML Techniques

R. Licence and M. Butler

RW.8.7 Analysis of the Possibilities of Using GNSS Satellite Systems in Determining the Geometry and Examining the Deformation of Rail Routes

M. Strach

RW.8.8 Detecting Anomalies Inside Rolling Stocks using Audio Streams and Deep Learning

S. Afanou

RW.8.10 A Comparative Analysis of Visual Odometry in Virtual and Real-World Railways Environments

G. Damico, M. Marinoni and G. Buttazzo

RW.8.11 Predictive Maintenance Optimisation for CCTV Systems in Electric Multiple Unit Trains Using Machine Learning Techniques

M.M. Rahman, B. Alkali, A.K. Jain, J.M. Parrilla Gutierrez, C. Mcneil and J. Nelson

RW.8.12 Machine Learning Methodology for Identification of Multiple Out-of-Round Railway Wheels using Data from Wayside Monitoring Systems

J. Magalhães, T. Jorge, A. Meixedo, A. Guedes, R. Silva and D. Ribeiro

12:45-13:45: Lunch

Day 4: Wednesday, 4 September 2024: AM, Room C217

11:00-13:00

Chaired by: Nicola Bosso and Auteliano Santos Jr.

Invited Lectures

RW.2.4 Effect of Hardness and Temperature on Wheel-Rail Wear: Theoretical and Experimental Study
Z. Shi, E. Meli, L. Nencioni and A. Rindi

Wheel-Rail Interaction: Tribology, Degradation, Monitoring, Maintenance, Modelling and Validation

organized by: Dr. Michaël Steenbergen, Prof. Auteliano Santos Jr. and Prof. Nicola Bosso

RW.9.6 A Wheel Wear Prediction Model Based on the Wheel-Rail Rigid Slip Considering Curve Contact Area
Y. Sun, M. Xing and Z. Shi

RW.9.7 Thermal Vision Analysis of Wheel-Rail Interaction: Application of Convolutional Neural Networks
M. Słowiński, T. Staśkiewicz, K. Grochalski and B. Jakubek

RW.9.9 Procedure for Wheel-Flat Identification on Railway Wheelset Based on Field and Laboratory Experimental Tests
A. Cavallo, M. Bahgat, G. Tomasini, F. Castelli-Dezza, S. Cervello and D. Regazzi

RW.9.10 Effects of Gauge Widening and Wheel Wear on Low Rail Surface Damage of Heavy Haul Line
O.P. Yadav, J. Leung, S. Stichel and M. Berg

RW.9.11 Impact of Wheel Hollow Wear on Heavy-Haul Vehicle Components
P. Augusto De Paula Pacheco, M.V. Lopes, G.F. Mendonça Dos Santos, M. Costa and A.A. Santos Jr

RW.9.13 Understanding Grease Retentivity in Wheel-Rail Contact
D. Kvarda, M. Omasta, I. Křupka and M. Hartl

12:45-13:45: Lunch

Day 4: Wednesday, 4 September 2024: AM, Room C219

11:00-13:00

Chaired by: Yu Pan and Luca Pugi

Traction and Braking: Control, Safety and Energy Recovery

organized by: Prof. Jianyong Zuo, Prof. Nicolò Zampieri, Dr. Yu Pan and Dr. Jingxian Ding

RW.14.7 Analysis of the Influence of Working Rate and Energy Consumption of Air Compressor in EMU Air Supply System Considering Leakage

T. Wang, J. Zuo, J. Ding, X. Wu and Y. Pan

RW.14.8 Preliminary Design of a WSP System for an Articulated Freight Wagon

F. Mazzeo, M. Santelia, E. Di Gialleonardo and S. Melzi

RW.14.9 Analysis of Heat Dissipation of Carbon Ceramic Brake Discs on High-Speed Trains and Its Impact on Surrounding Components Based on Thermal-Solid-Fluid Coupling Method

G. Chen, Y. Pan, S. Zheng, J. Zuo and J. Ding

RW.14.10 Brake Noise Analysis of High-Speed EMU Based on Complex Mode Analysis Method

H. Zhou, Y. Pan, J. Zuo and J. Ding

Alternative Power Supply and Sustainable Rail Transport

organized by: Dr. Luca Pugi and Prof. Qing Wu

RW.12.8 Failure Prediction of Railway Battery Cells Under Large Deformations

L. Pugi, D. Barbani, A. Kociu, M. Delogu, L. Berzi and N. Baldanzini

RW.12.7 A Comprehensive Train Model for Driving Optimization and Energy Saving

S. Kapoor, W.Z. Liu, W. Guo and M. Berg

RW.12.10 Examining Hydrocarbon Fuels for Transport in a Decarbonised World

S. Lloyd and W. Atteridge

RW.12.11 Standardized Sizing for Alternative Drivetrains in Rail Vehicles: A Modular Approach for Enhanced Efficiency and Cost Reduction

M. Scharmach, M. Konrad, M. Schenker and K. Mullankuzhy

12:45-13:45: Lunch

Day 4: Wednesday, 4 September 2024: AM, Room C221

11:00-13:00

Chaired by: Bjorn Pålsson and Roger Dixon

Switches and Crossings Developments

organized by: Prof. Yann Bezin and Prof. Björn Pålsson

RW.6.10 Modeling of CWR Tracks Including a Switch

J.-F. Ferrellec, T. Haljouji, B. Jeanselme, Z. Wang and M. Wone

RW.6.8 Multibody Study of a Repoint Stub Switch with Passive Locking Feature

R. Ambur, R. Dixon, O. Olaby, R. Corbin, H. Duan and L. Li

RW.6.11 Condition Based Maintenance for Railway Turnouts

D. Garcia Sanchez, G. Arteta, P. Pascual and P. Infante

RW.6.12 Assessment of Structural Requirements for Crossing Panel Design using Dynamic Load Case Scenarios

H. Vilhelmson, B.A. Pålsson and J.C.O. Nielsen

RW.6.13 Study on the Effect of Maintenance Conditions of Turnout for Switch Throwing Force

Y. Hori and Y. Michitsuji

RW.6.14 Investigating the Impact of Foreign Objects on Railway Switch Control: Numerical Simulations and Field Measurements

S.K.K. Bysani, B.A. Pålsson, E. Kabo and B. Paulsson

RW.6.16 Validation of a movable-point turnout design: a complete vehicle-turnout interaction model

C. Somaschini, Q. Li, S. Alfì, E. Di Gialleonardo and A. Collina

RW.6.17 Development and Testing of a Full-Scale Repoint Track Switch System

L. Li, R. Ambur, R. Dixon, R. Corbin, H. Duan and O. Olaby

12:45-13:45: Lunch

List of participants

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