

# RAILWAY ENGINEERING-2015

**13th International Conference & Exhibition**  
**30th June - 1st July 2015**

Radisson Blu Hotel  
Royal Mile  
Edinburgh  
EH1 1TH

**100+**  
**Papers**  
**from 23**  
**Countries**

A limited number of additional papers may be accepted.  
Extended Abstract deadline : 31st March 2015

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## Keynote Papers :

- WORLD RAILWAYS IN AN ERA OF CHANGE, Chris Jackson, Railway Gazette International, Sutton, Surrey, UK
- FUTURE RAILWAYS, Prof Rod Smith, RAEng/Network Rail Research Prof, Imperial College London, UK

# PROVISIONAL LIST OF PAPERS : PARALLEL SESSIONS WILL BE USED EACH DAY

## High Speed Rail – Ballasted Track

- ASSESSING FEASIBILITY OF BALLASTED TRACK FOR HS2, D Perez Martin, HS2 Ltd, London, PE Gautier, L Deroche, P Mansoz, Systra, M Antoni, SNCF, France
- RESEARCH ON VERTICAL NATURAL VIBRATION MODES OF BALLAST AGGREGATE IN BALLASTED TRACK, Dr A Aikawa, RTRI, Tokyo, Japan
- BALLAST TRANSPORT IN EVENT OF OVERFLOWING OF DRAINAGE SYSTEM ON HIGH SPEED LINES, J Amblard, C Pams Capoccioni, D Nivon, L Mellal, SNCF, France, G De Cesare, T Ghilardi, M Jafarnejad, EPFL, Lausanne, Switzerland

## High Speed Rail – Slab Track

- USE OF MULTI-BODY SIMULATION TO OPTIMISE ALIGNMENT DESIGN LIMITS OF SLAB TRACK HIGH-SPEED LINES, S Kraft, SB Hadid, P Dupont, SNCF, La Plaine St Denis, France

## High Speed Rail – Noise & Vibration

- DESIGN OF TUNNEL ENTRANCE HOODS TO PREVENT SONIC BOOMS, R Sturt, Arup, Solihull, UK
- USE OF 3D FEM TO SIMULATE GROUND BORNE VIBRATION IN RAILWAY APPLICATIONS, B Nelain, N Vincent, Vibratex, Ecully, France
- GENERALIZED SHOCK SPECTRUM OF STRUCTURES IN TUNNELS DUE TO AERODYNAMIC LOADING, Dr M Reiterer, Revotec zt gmbh, Vienna, Dr H Kari, Austrian Federal Railways, Austria
- FAST APPROXIMATION OF CRITICAL VELOCITIES ON HIGH SPEED RAIL LINES, D Connolly, P Alves Costa, S. Mezher, O Laghrouche, J Pombo, PK Woodward, Heriot Watt Univ, Edinburgh & MC Forde, Univ of Edinburgh, UK
- AERODYNAMIC IMPACT & STRUCTURAL ASSESSMENT OF NOISE BARRIERS ALONG A HIGH SPEED RAIL LINE IN AUSTRIA, S Lachinger, AIT Austrian Institute of Technology, Vienna, H Kari, Austrian Federal Railways (ÖBB), Austria
- EFFECT OF PARAMETRIC EXCITATION ON GROUND BORNE VIBRATION IN RAILWAY APPLICATIONS, B Nelain, N Vincent, Vibratex, Ecully, France
- ESTIMATING CRITICAL VELOCITY OF TRAINS FROM RAYLEIGH WAVES USING CONVENTIONAL SITE INVESTIGATION DATA, DP Connolly, Heriot-Watt Univ, Riccarton & MC Forde, Univ of Edinburgh, UK

## High Speed Rail

- INFLUENCE OF DISTANCE BETWEEN BRIDGE & EXPANSION JOINT ON TRACK GEOMETRY MEASUREMENT FOR HIGH-SPEED RAILWAY LINES, J Causse, F Pison, F Coudert, P Pouligny, SNCF, France
- ASPECTS REGARDING TRACK DYNAMICS ON LINES FOR HIGHER SPEEDS ON RAILWAY NETWORK IN NORWAY, H Gasemyr, Jernbaneverket, Oslo, Norway
- DESIGN FOR CONTINUOUS RAILS ACROSS STRUCTURAL DISCONTINUITIES : DEVELOPING BETTER CODES FOR TRACK-BRIDGE INTERACTION, Dr D Rhodes, D R Squared Ltd, Taunton, UK
- RECONSTRUCTION OF TRACK GEOMETRY FROM 3-POINT MEASUREMENT DATA USING KALMAN FILTER, Y Naganuma, Central Japan Railway Co, Aichi, A Yoshimura, Tokyo Univ of Technology, Tokyo, Japan
- NUMERICAL TOOL TO ASSESS DYNAMIC BEHAVIOUR OF DIFFERENT TRACK DESIGN, E Arlaud, S. Costa D'Aguiar, SNCF, E Balmes, Arts et Metiers ParisTech, Paris, France
- USE OF A TRAIN TRACK INTERACTION MODEL FOR TRACK OPTIMIZATION, M Baessler, J Bronsert, BAM, Berlin, Germany
- MEETING SKILLS CHALLENGE FOR BRITAIN'S RAIL INDUSTRY, N Eagers, National Skills Academy Railway Engineering, London, UK

## High Speed Rail Electrification

- EFFECT OF CONTACT-WIRE WEAR & TEMPERATURE CHANGE ON CURRENT CORRECTION PERFORMANCE OF SHINKANSEN, M Tsunemoto, Railway Technical Research Institute, Tokyo, Japan
- UK & WORLDWIDE SOLUTIONS FOR HIGH SPEED RAILWAY OVERHEAD CONTACT SYSTEMS, A Halangau (Andreica), G Baird, Ove Arup & Partners International Ltd, York, UK

## Classic Rail Electrification

- SEMI-ACTIVE PANTOGRAPH USING VARIABLE STIFFNESS SUSPENSION, S Shin, KRRI, Uiwang, Korea
- COMPARISON OF DESIGN OF Laterally Loaded Piles for OLE STRUCTURE, J Meltzer, IM Alobaidi, Atkins Ground Engineering, Birmingham, UK
- ECONOMIC ASSESSMENT OF ESS FOR PEAK LOAD SHAVING IN SUBSTATION OF URBAN RAILWAY USING ANNUAL COSTS, JY Park, KRRI, Uiwang, Korea
- MINIMISING COST OF ELECTRIFICATION BY ASSESSING SPACE AVAILABLE FOR OVERHEAD LINE EQUIPMENT, N Barker, Balfour Beatty Rail, Matlock, UK
- UNDULATE TEMPERATURE PHENOMENA IN HIGH CURRENT DENSITY CONDUCTORS, C Langridge, Riker Ltd, Melksham, J Lasenby, Univ of Cambridge, UK
- TENSION FLUCTUATION CHARACTERISTICS OF OVERHEAD CONTACT LINE, K Jimbo, M Tsunemoto, M Shimizu, S Saito, RTRI, Tokyo, Japan

## Slab Track

- DESIGN & MONITORING OF NEW BALLASTLESS TRACKFORM, A Brisson, S Kolodziejzski, JM Vanzenberg Centre d'essais ferroviaires, Petit-Foret, C Masson, L Pesqueux, Alstom Transport, T Sedran, LM Cottineau, IFFSTAR, F Barresi, Vossloh, J Caillaud, D Desmyter, Railtech, C Keseljovic, RFF, France
- PROTOTYPE FATIGUE TEST OF SLAB TRACK UNDER COUPLING ACTION OF TRAIN LOAD, TEMPERATURE CHANGE & WATER EROSION, P Zhao, L Guo, X Liu, R Yang Southwest Jiaotong Univ, Chengdu, China
- SLAB TRACK PERFORMANCE UNDER HEAVY HAUL REVENUE CONDITION & ITS REMEDIATION METHOD, R Zhang, A Karsten, Australian Rail Track Corporation, Broadmeadow, NSW, Australia

## Ballasted Track

- TAMP (TRACKBED ANALYSIS & MODELLING PLATFORM) - A TRACK DETERIORATION MODEL, P Sharpe, S Middleton, D Kite, A Nelson, AECOM, Nottingham, UK
- STUDY OF BALLASTED TRACK ON PORTLAND CONCRETE SLAB, M Toledo, CE Lima de Paiva, SJ Watanabe, Unicamp, Brazil
- FULL SCALE CYCLIC TESTING OF AN UNDER SLEEPER APPLICATION OF RESILIENTLY BOUND BALLAST, Dr C Ho, H Faghihi-Kashani, Univ of Massachusetts, Amherst, MA USA, JP Hyslip, W Moorhead, TRAMMCO, LLC, USA
- OBSERVATION OF BALLAST PARTICLES' BEHAVIOR AROUND RESILIENT SLEEPERS USING 3D-DEM, A Kono, RTRI, Tokyo, T Matsushima, Univ of Tsukuba, Japan
- MAINTENANCE OF BALLASTED TRACK SYSTEMS IN UK, B Counter, Univ of Derby, UK

## Sleepers & Ties

- AUTOMATED SLEEPER INSPECTION USING INTERNAL IMAGING TECHNIQUES, J Belcher, GT. Grissom, Georgetown Rail Equipment, TX, JE Baciak, Univ of Florida, USA
- DESIGN OF HOLES & WEB OPENINGS IN RAILWAY PRESTRESSED CONCRETE SLEEPERS, S Kaewunruen, AM Remennikov, EK Garnage, Univ of Birmingham, UK
- RECYCLED PLASTIC RAILWAY SLEEPERS, A van Belkom, Lankhorst, Friesland, Netherlands
- EFFECT OF UNSUPPORTED TIES AT TRANSITION ZONES, S Wilk, TD Stark, Univ of Illinois at Urbana-Champaign, H Thompson, Federal Rail Administration, T Sussman, Univ of Hartford, USA
- FFU SYNTHETIC SLEEPER SLIM TIE & LONGITUDINAL BAULKs, G Koller, Koocoo Technology & Amp Consulting GmbH, Vienna, Austria, & G Simpson, Network Rail, UK
- LATERAL RESISTANCE OF DIFFERENT TYPES OF SLEEPERS IN BALLASTED RAILWAY TRACKS, J A Zakeri, A Bakhtiari Iran Univ of Sci & Tech, Tehran, Iran

## Earthworks

- DETERMINATION OF YOUNG'S MODULUS USING SEISMIC SURFACE WAVES, S Wilk, T D Stark, Univ of Illinois at Urbana-Champaign, H Thompson, Federal Rail Administration, T Sussman, Univ of Hartford, USA
- GROUND MODELS FOR ASSESSING SEISMIC WAVE PROPAGATION IN SHALLOW SUBSURFACE, Dr D Gunn, B Dashwood, J White, BGS Keyworth, G Williams, BGS, Edinburgh, S Donohue & P Bergamo, Queen's Univ, Belfast, UK
- PREDICTION OF EARTHWORKS FAILURE USING TRACK RECORDING CAR DATA, P Sharpe, S Middleton, AECOM, Nottingham, UK

## Railway Maintenance & Management

- TRACK SUBSTRUCTURE MANAGEMENT ON USA RAILWAYS, J Hyslip, HyGround Engineering, Williamsburg, MA, & S Chrismer, AMTRAK, USA
- DECISION MAKING UTILIZING A LARGE DATA SET MEASURED BY TRACK CONDITION MONITORING DEVICE ON A COMMERCIAL SERVICE CAR, T Onodera, East Japan Railway Co, Saitama-City, Japan
- TRACK MAINTENANCE STRATEGIES OPTIMIZATION PROBLEMS, G Krug, Drs KRUG Consulting Service, Tel Aviv, Israel, J Madejski, Silesian Univ of Technology in Gliwice, Poland
- COMPETENCY MANAGEMENT APPLIED TO VOLUNTEER WORKFORCE WITHIN UK HERITAGE RAILWAY INDUSTRY R Baughan & M Crapper, Univ of Edinburgh, UK
- MEASURES FOR ASSESSMENT OF RAILWAY NETWORK CONDITION - POLISH EXAMPLE, A Massel, Instytut Kolejnictwa, Warsaw, Poland
- AUTONOMOUS INTEGRATED CONDITION-BASED, PLANNING & COST WEIGHTED RAIL INTELLIGENT MAINTENANCE, I Durazo-Cardenas, A Starr, C Turner, L Kirkwood, M Bevilacqua, P Baguley, Cranfield Univ, UK
- 150 YEARS OF SRI LANKAN RAILWAYS: EMPLOYEE & CUSTOMER PERCEPTION OF SERVICE, A Kulatunga, RA Kesavan, C Chandrakumar, AK Kulatunga, RTD Rajapaksha, RKGDM Senewiratne, Univ of Peradeniya, Sri Lanka
- LIFE CYCLE ASSESSMENT OF RAIL TRACK SUPERSTRUCTURE, FM Soto, G Di Mino, CM Di Libertò, S Noto, NC Armijo Univ of Palermo, Italy
- DATA FUSION STRATEGY FOR PRECISE VEHICLE LOCATION FOR INTELLIGENT SELF-AWARE MAINTENANCE SYSTEMS, M Bevilacqua, A. Tsourdos, A. Starr, I. Durazo-Cardenas, Cranfield Univ, UK

## OPEN DISCUSSION FORUMS :

## NETWORKING OPPORTUNITIES :

DAY 0 : 7PM 'ICEBREAKER' AT CONFERENCE VENUE

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**Track & Rail Inspection**

- **NON-INVASIVE MONITORING OF TRACK SYSTEM GAPS**, S Wilk, TD Stark, Univ of Illinois at Urbana-Champaign, H Thompson, Federal Rail Administration, T Sussman, Univ of Hartford, CT, USA
- **REMOTE SURVEY IN RAIL INDUSTRY**, T Burton, Fugro Geospatial BV, Coleraine, N Ireland, UK
- **BETTER UNDERSTANDING OF STABILITY OF TURNOUTS IN CWR TRACK BY IN-FIELD MEASUREMENT & NUMERICAL STUDY**, R Zhang, H Wu, Australian Rail Track Corporation, Broadmeadow, NSW, Australia
- **SURVEYING RAILWAY INFRASTRUCTURE & TRACK GEOMETRY USING COMBINED AERIAL & TRAIN MOUNTED LIDAR SYSTEMS**, N v.d Hurk, Fugro Rail Data BV, Coleraine, UK
- **8080SX POD - ULTRASONIC RAIL FLAW DETECTION SYSTEM FOR 21ST CENTURY**, D Arbuthnott & R Hallam, Balfour Beatty Rail, Derby, UK
- **DEVELOPMENTS IN NON-INVASIVE BALLAST MONITORING**, M Lim, S Ivanov, R De Bold, A Giannopoulos & MC Forde, Univ of Edinburgh; DP Connolly, Heriot Watt Univ, Riccarton, UK

**Track Sub-Structure**

- **INFLUENCE OF MOISTURE ON THERMOMECHANICAL BEHAVIOUR OF BITUMINOUS MIXTURES USED FOR RAILWAY TRACKBEDS**, D Ramirez, N Calon, A Robinet, SNCF, La Plaine Saint-Denis, FH Di Benedetto, C Sauzeat, Entpe, France.
- **RAILWAY TRACKFORM STIFFNESS TESTER - IMPROVED STIFFNESS TESTING METHODOLOGY**, C Govan, P Sharpe, AECOM, Nottingham, UK
- **FULL-SCALE CYCLIC LOADING TRIALS ON TRACK BED WITH & WITHOUT GEOGRID STABILISATION**, M Horton, J Cook, Tensar International Ltd, Blackburn, VS Belyaev, PNF Stroy Dinamika, Prof ES Ashpiz, Moscow State Univ of Rail Eng (MIIT), Russia
- **ANALYSIS OF TRACK PERFORMANCE OVER INNOVATIVE TRACKBED TREATMENTS IN TRANSITION ZONES**, R Bianchi, Univ of Pisa, Italy, P Sharpe, AECOM, Nottingham, UK
- **RESISTANCE TO PERMANENT DEFORMATION OF DRY ASPHALT RUBBER CONCRETE FOR SUB-BALLAST LAYER** N C Armijo, M Di Paola, G Di Mino, C M Di Liberto, Univ of Palermo, Italy
- **MERGING APPROACH TO EVALUATE SUSTAINABILITY OF RAIL TRACK SUPERSTRUCTURE** NC Armijo, G Di Mino, S Noto, CM Di Liberto, FM Soto, Univ of Palermo, D Lo Presti, Univ of Nottingham, UK
- **LIFE CYCLE ASSESSMENT OF RAIL TRACK SUPERSTRUCTURE**, FM Soto, G Di Mino, CM Di Liberto, S Noto, NC Armijo Univ of Palermo, Italy
- **SUBBALLAST PERFORMANCE IN BRAZILIAN RAILWAY INFRASTRUCTURES**, CE Lima de Paiva, UNICAMP, Brazil Adelino Ferreira, Univ of Coimbra, Portugal
- **RESISTANCE TO FATIGUE OF DRY ASPHALT RUBBER CONCRETE FOR SUB-BALLAST LAYER**, F Martinez-Soto, G Di Mino, CM Di Liberto, S Noto, Univ of Palermo, Italy
- **INFLUENCE OF PRIME COAT ON RAILWAY TRACK INFRASTRUCTURE LAYERS**, C de Franco Peixoto, C E Lima de Paiva, UNICAMP State Univ of Campinas, Sao Paulo, Brazil
- **NUMERICAL 3-D PERFORMANCE OF A SETTLEMENT RECOVERY MODULE FOR SETTLEMENT RESTRAIN OF RAILWAY ROADBED**, HK Kim, MH Shin & B Kim, KRRI, Uiwang, Korea

**Rails**

- **CONTINUOUSLY WELDED RAILS IN CURVES WITH SMALL RADIUS - DEVELOPMENT OF REGULATIONS & LEGISLATIONS IN SWITZERLAND**, M Kohler, Federal Office of Transport, Bern, Switzerland
- **SELECTION OF RAILS BASED ON NETWORK FUNCTIONALITY & SPECIFIC CONDITIONS OF RAILWAY SYSTEM**, C Pyrgidis, N Demiridis, D Pahoumis, Aristotle Univ of Thessaloniki, Greece
- **STUDY ON IMPACT NOISE DUE TO RAIL JOINTS**, T Sueki, T Kawaguchi, T Kitagawa, RTRI, Tokyo, Y Okumura, Y Hori, East Japan Railway Co, Japan
- **RESEARCH ON IMPROVED MANAGEMENT OF INSULATED RAIL JOINTS**, M Dhanasekar, Queensland Univ of Technology, Brisbane, Australia
- **GROWTH OF RAIL SURFACE IRREGULARITY & ESTIMATION MODEL FOR RAIL CORRUGATION**, H Tanaka, K Sano, M Miwa, RTRI, Tokyo, Japan
- **CONTINUOUSLY WELDED RAILS IN CURVES WITH SMALL RADIUS**, P Braess, B Bopp, ETH Zurich, Switzerland
- **MINIMISING FAILURE OF RAIL JOINTS THROUGH MANAGING LOCALISED VEHICLE-TRACK INTERACTION**, H Askarnejad, M Dhanasekar, Queensland Univ of Technology (QUT), Brisbane, Australia

**Permanent Way**

- **NEW LOW MAINTENANCE HIGH FIXITY TRACK FORM FOR RAILWAY TUNNELS**, D Kelly, M Hunt, Balfour Beatty Rail, Matlock, UK
- **APPLICATIONS OF POWER RAIL TRACK SOFTWARE IN TRACING BRAZILIAN ALIGNMENTS**, M Toledo Arenas, CE Lima de Paiva, R S J Munoz, Unicamp, Brazil
- **RISK MANAGEMENT AT RAILROAD GRADE CROSSINGS: A DECISION SUPPORT SYSTEM**, C Pyrgidis, C Anastasiadou, P Papaioannou, Aristotle Univ of Thessaloniki, Greece
- **UNDER SLEEPER PADS: FIELD INVESTIGATION OF THEIR ROLE IN IMPACT MITIGATION**, S Kaewunruen, AM Remennikov, Univ of Birmingham, UK

**Heavy Haul**

- **ASPECTS REGARDING INCREASED AXLE LOADS ON HEAVY HAUL LINES IN NORWAY**, H Gasemyr, Jernbaneverket, Oslo, Norway
- **TRACK GEOMETRY DEGRADATION & OPTIMISATION OF SLEEPER SUPPORT CONDITIONS ON A SWEDISH IRON ORE LINE**, J Nielsen, CHARMEC, Gothenburg, E Berggren, EBER Dynamics AB, Falun, R Bolmsvik, Abetong AB, Växjö, A Hammar, Trafikverket, Borlänge, T Axelsson, ÅF Infrastructure AB, Helsingborg, Sweden
- **FLÅM LINE, CONSEQUENCES OF INCREASING AXLE LOAD OF LOCOMOTIVES CONCERNING STRESSES ON PERMANENT WAY**, H Gasemyr, Jernbaneverket, Oslo, Norway
- **TRACK RECONDITIONING & DRAINAGE IMPROVEMENT IN TUNNEL ON HEAVY HAUL LINE**, R Zhang, A Karsten, Australian Rail Track Corporation, Broadmeadow, NSW, Australia

**Rail Maintenance**

- **RECONSTRUCTING DESIGN TRACK GEOMETRY & ITS APPLICATION TO BAYESIAN RECONSTRUCTION OF RAILWAY TRACK GEOMETRY**, A Yoshimura, Tokyo Univ of Technology, Tokyo, Japan
- **8080SX POD - ULTRASONIC RAIL FLAW DETECTION SYSTEM FOR 21ST CENTURY**, D Arbuthnott & R Hallam, Balfour Beatty Rail, Derby, UK
- **IMPROVEMENT OF RE-ALIGNMENT PERFORMANCE FOR SHORT WAVELENGTH TRACK IRREGULARITY ON TAMPING MACHINE**, T Aoki, Y Naganuma, Central Japan Railway Co, Aichi, Japan
- **EFFECT OF MEASURES BY TRACK AGAINST VIBRATION ABOVE TUNNEL**, T Nanmoku, East Japan Railway Co, Tokyo, Japan

**Metros & Tramways**

- **DESIGN & OPERATION OF TRAMWAY & METRO DEPOTS - SIMILARITIES & DIFFERENCES**, C Pyrgidis, M Chatziparaskeva, Aristotle Univ of Thessaloniki, Greece
- **USE OF ACOUSTIC SIGNAL IN TRAMWAY MONITORING SYSTEM - POSSIBILITIES & LIMITATION**, B Czechyrza, Poznan Univ of Technology, Poland

**Rolling Stock**

- **DEVELOPMENT OF DYNAMIC GAUGES FOR ROLLING STOCK**, D Buckley, Balfour Beatty Rail, Matlock, P Gray, RSSB, London, UK
- **USING RELIABILITY BASED MAINTENANCE IN A RAILWAY APPLICATION**, P Conradie, Prof CJF Fourie Stellenbosch Univ, Cape Town, South Africa
- **FREIGHT BOGIE STEERING PERFORMANCE & WHEEL SQUEAL NOISE: AN IN-SERVICE MEASUREMENT SYSTEM**, S Gillespie, Jacobs, St Leonards, NSW, Australia
- **OPTIMUM NOSE SHAPE OF HIGH-SPEED TRAIN USING VEHICLE MODELING FUNCTION FOR REDUCTION OF AERODYNAMIC DRAG**, M Kwak, S Yun, C Park, KRRI, Uiwang, Republic of Korea
- **INTELLIGENT VISION BASED DRIVER ASSISTED SYSTEM FOR TRAINS - ELEPHANTS ACCIDENTS**, A Kulatunga, R Ekanayake, D Athauda, Univ of Peradeniya, Sri Lanka
- **DEVELOPMENT OF TRAINING OPTIMIZED DRIVING USING SIMULATORS TO DECREASE FUEL CONSUMPTION OF RAIL FREIGHT OPERATIONS**, T Martins, E Andrade, R Vieira, Vale S/A, Vitória, Brazil
- **ON-BOARD CYBERSECURITY IN RAILWAYS: ISSUES, CONSTRAINTS & IMPLEMENTATION**, S Lelong, Systra, Paris, France
- **PREDICTION OF NOISE & VIBRATION IMPACTS DUE TO OPERATION OF TEMPORARY CONSTRUCTION RAILWAYS DURING TUNNELLING WORKS**, D Clarke, SRL Technical Services Limited, Sudbury, UK

**Signalling**

- **MONITORING SYSTEM FOR RAILWAY SIGNAL EQUIPMENT USING RADIO COMMUNICATION - DEVELOPMENT FOR MOTOR POINT MACHINE & CROSSING CONTROL SYSTEM**, M Suzuki, T Kato, East Japan Railway Co, Saitama, Japan
- **ANALYSIS OF ACCESSIBILITY TO DISABLED OR REDUCED MOBILITY PEOPLE IN TRAIN STATIONS INTEGRATED WITH OTHER MODES TRANSPORT**, MT Francoso, SR Teodoro, State Univ of Campinas, UNICAMP, Brazil
- **AGILE DEVELOPMENT PROCESS FOR ETCS ON-BOARD SOFTWARE IN OPENETCS**, J Welte, E Schnieder, TU Braunschweig, Germany
- **RELIABILITY AVAILABILITY MAINTAINABILITY SAFETY (RAMS) MANAGEMENT OF RAILWAY SIGNALLING SYSTEMS & FMEA-FTA ANALYSIS APPLICATION**, I Yakin, MT Soylemez, M S Durmus, Istanbul Ulasim, Turkey

**Railway Bridges**

- **ACHIEVING ENGINEERED INCREASES IN SERVICEABILITY & ULTIMATE CAPACITY OF MASONRY ARCH RAILWAY UNDERBRIDGES WITH NO DISRUPTION TO TRAFFIC**, M Hunt, D Kelly, Balfour Beatty Rail, Matlock, UK
- **LIGHT BRIDGE FOR LIGHT RAIL**, G v.d Werf, Arcadis, Utrecht, Netherlands
- **DYNAMIC INTERACTION BETWEEN OPEN STEEL GIRDER BRIDGE & VEHICLE TAKING INTO ACCOUNT TRACK IRREGULARITY IN HIGH-SPEED RAILWAY**, T Otake, Y Ito, Y Kawasaki, Central Japan Railway Co, Aichi, Japan
- **DETERMINATION OF VERTICAL DISPLACEMENT OF METAL BRIDGES BY REQUEST OF A COMPOSITION (TRAIN-TYPE) WITH SURVEYING EQUIPMENT**, MT Francoso, JLA Trabanco, State Univ of Campinas - UNICAMP Campinas - SP, Brazil
- **RESILIENCE-BASED DESIGN OF PRECAST STEEL-CONCRETE COMPOSITES FOR RAILWAY TRACK SUPPORT STRUCTURE**, S Kaewunruen, DWP Griffin, O Mirza, K Kwok, Univ of Birmingham, UK

DAY 1 : High Speed Rail

DAY 2 : Classic &amp; Metro Railways &amp; Trams

DAY 1 : 7.30PM (OPTIONAL) CONFERENCE BANQUET

# RAILWAY ENGINEERING-2015

## NETWORKING OPPORTUNITIES & SOCIAL EVENTS

### ICEBREAKER

BBQ  
Food, Beer + Soft drinks

Monday 29th June 19.00 – 20.30  
The Exhibition Hall, Radisson Blu Hotel

This is an excellent opportunity for Delegates (from 30+ countries) and Exhibitors to network prior to the start of the Conference. Invitations will be issued to all Delegates (& their partners) and Exhibitors.

### CONFERENCE BANQUET

(Optional) @ £79 + VAT  
Tickets may be booked on the Registration Form, including tickets for guests.

Tuesday 30th June @ 19.30 for 20.00

### CONFERENCE LUNCHES AND ALL COFFEE AND TEA BREAKS WILL BE SERVED IN THE EXHIBITION HALL

A hot fork buffet lunch with soft drinks will be offered to registered Delegates and Exhibitors each day.

## IMPORTANT DATES

|  | DEADLINE        |
|--|-----------------|
| Submission of first draft of paper             | 6 February 2015 |
| Refereeing decision                            | 20 March 2015   |
| Submission of final corrected paper            | 2 April 2015    |
| Final acceptance of corrected paper            | 10 April 2015   |
| Final registration date as a presenting author | 17 April 2015   |
| Submission of PowerPoint                       | 1 June 2015     |

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|  | Before 31st January 2015 | 1 Feb – 31 March 2015 | 1st April 2015 onwards |
|--|--------------------------|-----------------------|------------------------|
| Presenting Author                        | £365                     | £410                  | £460                   |
| Graduate Student Presenting Author       | £275                     | £290                  | £325                   |
| Delegate (Not Presenting)                | £390                     | £460                  | £500                   |
| Graduate Student (Not Presenting)        | £230                     | £240                  | £260                   |
| Conference Dinner                        | £79                      | £79                   | £79                    |
| 2-Day Exhibition Fee : 2.5m x 1.5m Space | £1,050                   | £1,050                | £1,050                 |

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