

# **International Journal of Railway Technology**

*Editor:*  
**J. Pombo**

**Volume 4 - Issue 4  
2015**



The International Journal of Railway Technology (IJRT) is an international journal dedicated to research, development and application in the scope of railway systems. The aim of the Journal is to provide an international platform for researchers and experts to promote, disseminate and discuss the recent developments and advances in the field of railway technology. Furthermore, this publication aims to encourage interaction and collaboration between universities, research centers, railway operators and industry in order to identify problems, propose solutions and indicate directions for future research. The Journal publishes original papers that cover, but are not limited to, the following topics:

- **Rolling Stock:** Design, manufacture and maintenance; Modelling and simulation; High speed trains, light railways and freight capacity; Performance and optimisation; Aerodynamics and crosswind; Noise, vibration and comfort; Safety, security and reliability; Ergonomics and interior design.
- **Infrastructure:** Bridges, tunnels and transition zones; Track design, construction and maintenance; Interaction of vehicles with the infrastructure and the environment; Foundations; Track monitoring; Trackbeds: sleepers and ties; Geotechnical aspects: earthworks, embankments, stabilisation; Technologies for track defects detection.
- **Energy and Environment:** Re-use of kinetic energy; Energy sources and smart grids; Hybrid traction and power trains; Sustainable rail transport.
- **Signalling and Communication:** ERTMS - European Rail Traffic Management System; ITS - Information and Technology Systems.
- **Operations** Traffic management; Interoperability; Intermodal solutions.
- **Strategies and Economics:** Standards and regulations; Capacity and cost; Track access charges; Future trends in railway engineering.

© Saxe-Coburg Publications, Stirlingshire, Scotland

published 2015 by

**Saxe-Coburg Publications**

Dun Eaglais, Station Brae, Kippen

Stirlingshire, FK8 3DY, United Kingdom

*Saxe-Coburg Publications is an imprint of Civil-Comp Ltd*

ISSN 2049-5358

Volume 4 - Issue 4, 2015

### **British Library Cataloguing in Publication Data**

A catalogue record for this book is available from the British Library

Publisher's production and editorial team: Steven Miller, Jane Tabor, Rosemary Brodie

Cover design: Erzsébet Györi

Printed in Great Britain by Bell & Bain Ltd, Glasgow

# Contents

A Study of a Two-Dimensional High-Speed Train Model subject to Crosswinds and Heavy Rain <i>C.H. Xu, C.W. Jiang, Z.X. Gao and C.H. Lee</i>	1-33
Concurrent Engineering and Knowledge Reuse: A Digital Pattern Methodology to support Railway Industries <i>A. Balsamo, G. Di Gironimo, G. Frezza, A. Lanzotti, F. Peluso, S. Puzelli and P. Verdosci</i>	35-51
Finite Element Analysis of the Lock Stretcher Bar in a Railway Switch <i>H. Hemida, E. Stewart and C. Roberts</i>	53-71
Incorporating Complex Train Paths in an Analysis of Absolute Capacity <i>R.L. Burdett</i>	73-83
A Methodology for Assessing Track Irregularities with respect to Rail Damage <i>E.A.H. Vollebregt and M.J.M.M. Steenbergen</i>	85-105