

# Notes on Numerical Fluid Mechanics and Multidisciplinary Design

Volume 126

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# Noise and Vibration Mitigation for Rail Transportation Systems

Proceedings of the 11th International  
Workshop on Railway Noise, Uddevalla,  
Sweden, 9–13 September 2013

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# Preface

This volume contains the peer reviewed contributions to the 11th International Workshop on Railway Noise (IWRN11), which took place in Uddevalla, Sweden, on September 9–13, 2013. The workshop was organised by the Competence Centre in Railway Mechanics (CHARMEC) and the Departments of Applied Mechanics and Applied Acoustics at Chalmers University of Technology in Gothenburg, Sweden. It was supported by Bombardier Transportation, voestalpine Schienen, Lucchini and Chalmers / CHARMEC.

The workshop was attended by 160 delegates from 19 countries around the world: Sweden (33 delegates), Germany (18), United Kingdom (17), France (12), The Netherlands (11), China (8), Australia (7), Austria (7), Belgium (7), Czech Republic (7), Denmark (7), Switzerland (6), Japan (5), United States (4), Norway (3), South Korea (3), Spain (3), Finland (1) and Hong Kong (1).

Railway traffic is, in comparison with other modes of transportation, safe and environmentally friendly and is generally described as the most sustainable mode for regional and international transports. According to the White Paper on Transport, issued by the European Commission in 2011, one of the key goals by 2050 is a 50 % shift of medium distance intercity passenger and freight journeys from road to rail and waterborne transport. This will contribute to a 60 % reduction in carbon emissions by the middle of the century. To promote the shift from road to rail, the environmental impact induced by the railway in terms of noise and vibration needs to be further reduced.

Since the first IWRN in 1976, held in Derby (UK) with some 35 delegates, the workshop series has been established as a regular event that every three years brings together the leading researchers and engineers in all fields related to railway noise and vibration. The workshops have to a great extent contributed to the understanding and solution of many problems in railway noise and vibration, building a scientific foundation for reducing the environmental impact by air-borne, ground-borne and structure-borne noise and vibration.

Following the tradition from previous workshops, the scientific programme of IWRN11 was held as a single-session event (no parallel sessions) over three and a half days. The programme contained 55 oral presentations and 36 poster presentations, the latter including a three-minute oral presentation to introduce each poster. The present

volume contains the peer reviewed papers from 84 of these presentations, including 2 state-of-the papers on ground-borne vibration due to railway traffic and on railway noise generated by high-speed trains. IWRN11 covered 9 different topics of railway noise and vibration: 1. Prospects, legal regulation and perception, 2. Wheel and rail noise, 3. Prediction, measurements and monitoring, 4. Ground-borne vibration, 5. Squeal noise and structure-borne noise, 6. Aerodynamic noise generated by high-speed trains, 7. Resilient track forms, 8. Grinding, corrugation and roughness, and 9. Interior noise and sound barriers.

There is no formal organisation behind the IWRN but rather an informal, committed International Committee. It supports the chairman during the preparation process with the experience and expertise of its members. Assistance is given to formulate the scientific programme by reviewing the submitted abstracts, to act as session chairmen, and to act as peer review group and editors of the IWRN proceedings published in this volume.

The International Committee is grateful to Anders Frid, Wolfgang Kropp, Roger Lundén, Astrid Pieringer and Peter Torstensson of the local committee for their great commitment and care in organising the workshop. Special thanks to Pernilla Appelgren Johansson, Christian Johansson and Sara Nielsen for their work related to the administration, communication and graphic design of material for the Workshop, and to the staff of Bohusgården Hotel & Conference Centre.

The editors of this volume are grateful to Professor Wolfgang Schröder as the general editor of the “Notes on Numerical Fluid Mechanics and Multidisciplinary Design” and also to the staff of the Springer Verlag (in particular Dr Leontina Di Cecco) for the opportunity to publish the proceedings of the IWRN11 workshop in this series. Note that previous workshop proceedings have also been published in this series (IWRN9 in volume 99 and IWRN10 in volume 118).

We hope that this volume will be used as a “state-of-the-art” reference by scientists and engineers involved in solving noise and vibration problems related to railway traffic.

June 2014

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