NOTES ON NUMERICAL FLUID MECHANICS AND MULTIDISCIPLINARY DESIGN · VOLUME 99

Noise and Vibration Mitigation for Rail Transportation Systems

Proceedings of the 9th International Workshop on Railway Noise, Munich, Germany, 4–8 September 2007

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Preface

This book contains the presentations given during the 9th International Workshop on Railway Noise (IWRN9) which took place in Munich/Feldafing, Germany, on 4th to 8th September 2007. This workshop was organised by the Acoustics and Vibration Department of DB Systemtechnik, the technical engineering office of Deutsche Bahn AG.

More than 120 participants from 17 countries followed the invitation to the workshop. This great response showed the continuing interest in an important topic of railway technology and offered the opportunity to present the recent results of intense worldwide activities to the international community of railway noise and vibration experts and to share knowledge as well as experience.

Because an efficient transportation network is indispensable to handle the general mobility increase and road networks have reached their socio-ecological limits, the railway network is to be strengthened. For example the European Commission has given distinct political signals to get more passengers onto the railways. This policy represents a clear challenge for the next few decades not only for European railway companies: the considerable increase in mobility will lead to a doubling of the railway traffic volume within the next 10 to 20 years.

To reduce the environmental impact, the Directive on the Assessment and Management of Environmental Noise has been put into force in Europe, aiming at avoiding, preventing or reducing harmful effects of environmental noise on human health. This directive requires member states to produce strategic noise maps by using noise indicators assessing the number of people affected by noise, to inform the public about noise exposure, and to draw up action plans to reduce noise where necessary. These action plans will also tackle railway noise.

Responses to these subjects simultaneously involve the variety of rolling stock vehicles, infrastructure and also operating conditions. Since often efficient and economically satisfying solutions to railway noise problems cannot be found on one single component of the system alone, they need to be studied by considering the railway system with its interdependencies.

The IWRN9 contributions give state-of-the-art answers to such questions and address general rolling noise aspects, new noise reduction technologies, prediction tools and theoretical models, high-speed trains, ground-borne vibrations, cost-benefit considerations of noise abatement as well as rail grinding, corrugation and roughness.

Following the tradition of the previous workshops, IWRN9 was held as a single session event with the aim of providing the optimistic atmosphere for informal and inspired exchange of information on all facets of railway noise and vibration mitigation. Over three and a half days, 64 papers were presented in 13 sessions and in a poster session additional 11 presentations were subject of lively discussion.

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, to release the Call for Papers, to perform the paper selection process, to act as session chairmen at the IWRN9 workshop and to act as a peer review group for the IWRN9 proceedings.

Special thanks are due to Andrea Sahner, Gisela Rothermel, Melanie Payer, Wolfgang Behr and Alfred Hechenberger of the local committee for all the hard work and care in organising the conference.

The editors are grateful to Prof. E.H. Hirschel as the general editor of the "Notes on Numerical Fluid Mechanics and Multidisciplinary Design" and also to the staff of the Springer Verlag for the opportunity to publish the proceedings of the IWRN9 workshop in this series.

We look forward to this volume being used as a "state-of-the-art" reference by scientists and engineers involved in solving noise and vibration problems related to railway traffic in the years to come.

December 2007

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