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Guest Editorial

This Special Issue of the Journal of Sound and Vibration contains a collection of selected papers presented at the EUROMECH Colloquium 484 on Wave Mechanics and Stability of Long Flexible Structures Subject to Moving Loads and Flows held at Delft University of Technology, The Netherlands, 19–22 September 2007.

EUROMECH Colloquium 484 was organized by TU Delft with the aim of bringing together specialists in the dynamics of structures subjected to moving loads and flows. According to the experience of the organizers, the 'moving load community' and the 'flow–structure interaction community' attend different conferences and symposia. This is probably because the 'wet' physics of fluid–structure interaction and the 'dry' physics of load–structural interaction differ so much. Also, the engineering applications are perhaps generally considered to be too far from each other to be discussed in one room. Whatever the reason, relatively few discussions have taken place between these communities in the past, despite the obvious similarity of the mathematical models, methods of analysis and the focal issues of the research. In the framework of this Colloquium, the dynamics of structures in flows and under moving loads were discussed on the basis of the general theory of vibrations and waves. This approach helped unify the two communities and facilitated an efficient exchange of knowledge. The presence of a number of specialists in the general theory of vibrations and waves was most beneficial for the unification success.

There were 49 papers presented at the conference. Of those that were submitted for publication and have undergone peer review, 18 are published in this Special Issue. On behalf of the authors, the guest editor would like to express his appreciation for the very substantial contributions made to these papers by the anonymous reviewers.

The organisation of the papers in this Special Issue corresponds with the three main streams of research discussed at the Colloquium. The first group of papers is devoted to problems of fluid–structure interaction with the emphasis on the stability of slender structures in flows. The second group of papers is concerned with the dynamics of elastic structures under moving loads. Major attention is paid here to the dynamics of railway structures under high-speed trains. The third group comprises papers addressing some aspects of the general theory of vibrations and waves in elastic systems.

It is hoped that this Special Issue will be of interest to researchers specializing in the dynamics of structures subjected to moving loads and flows, and in the theory of wave mechanics of continua.

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