Vibration

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Special Issue Reprint

Railway Dynamics and Ground-Borne Vibrations

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Rapid urbanization, the demand for efficient mobility, and the need to mitigate climate change are among the major societal challenges of our time. These challenges have driven the extensive expansion of railway infrastructure in modern cities, raising environmental concerns about the generation and propagation of vibrations and noise, which can adversely affect the comfort, well-being, and quality of life of people living and working in the vicinity of railway lines. In parallel, the increasing demands placed on railway systems, including higher speeds, traffic density, and enhanced operational reliability, have intensified the need for a deeper understanding of railway dynamics and the mechanisms governing the generation, transmission, and mitigation of vibrations and noise.
Addressing these challenges requires multidisciplinary approaches encompassing vehicle-track interaction, wave propagation in soils, structural dynamics, vibration control technologies, and monitoring systems. The Special Issue brings together nine contributions covering a broad spectrum of topics, ranging from fundamental studies of railway dynamic behaviour to practical solutions for vibration and noise prediction, mitigation, and monitoring.

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