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The present dissertation deals with issues related to the assessment of the impact of noise generated by increased speed railway vehicles on the surroundings. It was assumed that the differences in technical parameters of increased speed railway vehicles in comparison with conventional railway vehicles imply generating a different type of dynamic impacts on the environment. Identification of the main sources of noise in increased speed railway vehicles, based on actual results of acoustic measurements, allowed for a detailed identification of the dominant sources of noise emission and their amplitude-frequency characteristics.

The paper also takes into account issues related to the verification of selected noise assessment models, in terms of their most accurate reflection of the propagation phenomenon. On the basis of conducted experimental studies, the behavior of selected models describing the change of sound level in the one-third frequency bands, as a function of variable distance of the observer from the railway line on which high-speed railway vehicles are operated was verified. In addition, the author's model is presented together with a database built within the framework of the study, containing the actual waveforms in the time and frequency domain.

Within the framework of this dissertation, an attempt has been made to solve the problem related to the interpretation of results, which are based on the comparison of measured values to permissible values. For this purpose, an author's index of noise load was proposed, defining three ranges of noise values: acceptable, disturbing and unacceptable.