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Field Tests on a Track Structure Equipped with Rail Dampers

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Abstract

The evolution of railroad networks is a rise in train speed, which shortens journey times. However, higher velocities also cause more noise emissions to be released into the environment. The use of rail dampers is one potential strategy for reducing this issue.

Rail dampers are elements fixed on both sides of a rail that alter its overall dynamic properties, suppressing the sound wave being emitted. Dampers are elastic components that cover either fully or partially rail chambers and can include elements with a certain mass, such as steel inserts. The presence of rail dampers can improve the general dynamic characteristics of the rail system.

The paper focuses on field experiments oriented on the identification of dynamic characteristics of a track structure equipped with rail dampers, influencing the level of noise emission. Field tests conducted on the railway line sections allowed the authors to determine the track decay rate (TDR) of different setups and compare the results of rails equipped with dampers to one without. It was proved that TDR field tests make it possible to assess the dynamic characteristics of track structures, which could be used as a part of structural condition assessment. Moreover, the test results allow understanding and simulating the phenomena which cause noise emissions. The presented tests can be used not only for regular service assessment but also to investigate solutions aimed at the protection of people and environment against noise from railway traffic.

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Keywords: *Impulse field test, Rail dampers, Track decay rate*

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