Evaluation Method of Railway Rolling Noise Using Scale-model Tests

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The rolling noise due to railway vehicles can be evaluated in scale-model tests. In this paper the similarity laws associated with rolling noise are developed. To verify the validity of these scaling relations, the scale-model measurements were compared with the results of actual field tests. The rail vibration measured in the scale-model test was in good agreement with the measurements from the field tests. However, the noise observed in the scale-model test had a low signal-noise ratio due to greater driven noise produced by the test rig itself. Although the noise from the test rig is relatively high, the agreement of the rail vibration indicates that scale-model tests can practically simulate actual rolling noise.