Development of Measurement Method for Aerodynamic Bogie Noise using Porous Plate

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A new measurement and evaluation method is proposed to precisely identify sources of the aerodynamic bogie noise in a wind tunnel test. A part of the ground under a bogie section is replaced by a porous plate, which lets the sound wave pass through while blocking off the airflow. A microphone array is installed under the porous plate toward the bogie. This measurement method makes it possible to determine sound sources of the bogie in detail. It is found that traction motors and gear unit, which are located downstream in the bogie section, are dominant sources. This experimental method and results can lead to a better understanding of the aerodynamic bogie noise and a contribution to the development of reduction techniques.