A Method to Evaluate Aeroacoustic Bogie Noise of Shinkansen High-speed Trains by Considering Acoustic Field

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Using a spatial distribution of the sound pressure level (SPL) obtained by a two-dimensional microphone array in a wind tunnel test, aeroacoustic bogie noise can be quantitatively estimated at measuring points. In such cases, it is necessary to appropriately consider noise generation and sound field with respect to various acoustic properties such as ground reflection and insertion loss of a bogie side cover. In this study, the transfer function between the integrated spatial distribution of SPL and results obtained by an omnidirectional microphone is calculated by a numerical method. The SPL of aeroacoustic bogie noise of Shinkansen trains can be estimated using this transfer function and compared with the results obtained in field tests.