# Development of Low-noise Pantograph for Future *Shinkansen* by Numerical Simulation


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### Abstract

In order to reduce the aerodynamic noise from a pantograph that is the biggest noise source of high-speed train, we performed LES calculations of turbulent flow around the pantograph head, which is a major aerodynamic noise source of pantograph. The result shows that surface pressure fluctuation is caused by interaction of disturbed flow by pantograph head with its support cover. We obtained the direction of configuration for reducing the noise by analyzing the noise generation mechanism. We also performed CFD of turbulent flow around the whole pantograph set and obtained the information of noise sources.



**Keywords :** Aerodynamic noise, Shinkansen, Pantograph, LES, Tetra-mesh, Large-scale simulation