

**Estimation of Aerodynamic Force  
Affecting Vibration of Narrow Gauge Train Running Through Tunnel**

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Although a number of researches have been made over the decade on aerodynamic force acting on Shinkansen trains running through tunnels which affects adversely ride comfort, any studies on the same effects on narrow gauge trains scarcely made. In this paper, we present results of on-track tests for estimating aerodynamic force acting on narrow gauge trains. The results are as follows: (1) The aerodynamic force, which stems from pressure fluctuations on the sides of a car, vibrates the car body running through a tunnel. (2) While the pressure fluctuations appear only on the train side facing the tunnel wall in double-track tunnels, the fluctuations in opposite phase on the both sides in single-track tunnels. By introducing the non-dimensional parameter using the air speed to the train and the train width, the on-track test data of the narrow gauge trains have indicated high coherence with those of the Shinkansen trains, although the non-dimensional peak frequencies of the pressure suggests that the pressure fluctuation develops faster along the narrow gauge trains than the Shinkansen trains.