

Development of Aerodynamic Brake for High-speed Railway

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To shorten the stopping distance by emergency braking of high-speed train, the author developed a small-size and light-weight aerodynamic braking device. The full-scale prototype is designed and manufactured. To examine its aerodynamic characteristics, several prototypes are tested on a wind tunnel facility at a maximum flow speed of 400 km/h. It has been proven that the response time of motion takes only 0.39 s, and the prototype could produce the aerodynamic drag of 2.3 kN per one unit. In addition, the performance is calculated using computational fluid dynamics (CFD). The result of the CFD analysis around a train roof with a large number of devices, it is found that the staggered arrangement could increase the total drag coefficients by 10 percent compared to the standard parallel arrangement.