Method of Wind Tunnel Test on Aerodynamic Characteristics of Vehicle under Cross Wind by using Moving Model Rig

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In order to evaluate a running safety of railway vehicles under strong winds, wind tunnel tests were executed under the approximately actual conditions in consideration of the influence of the velocity profile of a ground boundary layer and the effect of vehicle motion relative to the ground using a newly developed moving model rig. The model vehicle with 1/60th scale moves along a 20 m linear guide rail placed in front of a wind tunnel nozzle. The model vehicle runs at speeds of up to 10 m/s and the wind velocity is between 10 m/s to 20 m/s. We successfully measured steady surface pressures on the running vehicle surface and evaluated running effects on characteristics of aerodynamic forces acting on the vehicle model under cross winds within the boundary layer developed on the level ground along the floor of the test section.