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CFD Methods in Industrial Applications Vehicle External Aerodynamics and Aerodynamic Interaction of Moving Vehicles

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The paper deals with the properties of 3-D flow around a moving vehicle during the aerodynamic interaction with its environs. The models of rail vehicles intended for the public mass transport (fast trains, sub-urban trains units, underground and municipal railways trains) are simulated. Driving speeds of those vehicles are supposed in the range of 80–220 km/h. The computer simulations contribute to understanding and summarising the complex description of aerodynamic load of rail vehicles during various running regimes and situations, important aerodynamic effects occur during the passing of vehicles and/or under side wind. Simulations are carried out by means of commercial CFD code. Aerodynamic load is modelled as a special boundary condition in form of aerodynamic effect models. Those models describe (and to calculate) aerodynamic and interaction effects onto vehicles during passing and under side-wind and include time-dependent and space-dependent values of load. The studies allow to increase efficiency and accuracy of computer simulations.

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