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Development of Powertrain System Model for Urban Passenger Vehicle Simulations

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Abstract

The paper refers to the powertrain systems in urban electric passenger vehicles. The purpose of the work is to develop a model of a powertrain system of an electric passenger vehicle. The objective of this paper is to create mathematical and simulation models of the powertrain system, which are used to analyze the performance of the six-phase induction motor with fuzzy logic vector controller developed in previous studies. The analyses method use the simulation modeling of the electric vehicle powertrain and performance analyses during a standard driving cycle with the graphical representation of the result. Simulations show that the model can use different driving cycle profiles, consider all external forces, and provide all necessary data, such as the velocity of the electric bus together with the slip of the driving wheels for further controller tunning to overcome the override in resulting speed.

Keywords: analytical models, induction motors, mechanical power transmission, electric vehicles, mathematical models, electric buses, fuzzy controllers, simulation

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