

Modelling and simulation of powertrain system for electric car

ABSTRACT

It is widely believed that electric cars hold the key toward a greener mode of transport in the wake of an increased global energy consumption and greenhouse gas emission. However, on the downside, electric vehicles suffer from limited drive range and insufficient battery pack energy. Due to limited energy storage, effective power utility and energy efficiency are regarded as important for battery powered automobiles. To increase energy saving and provide better electric motor efficiency of an electric car, control algorithms such as field-oriented control strategy and space vector modulation can be used. This paper presents a study using Matlab/Simulink on vehicle parameters based on modelling and simulation of an electric car dynamics when integrated with an induction motor powered by Li-ion battery. It shall also describe a modelling of the electric powertrain leading to an analysis of on-board-to-wheel energy conversion. To achieve the model goals, the vehicle powertrain was simulated and the results further confirmed that both vehicle torque and speed correlate with an electric car acceleration index.

Keyword: Electric car; Powertrain; Induction motor; Field oriented control