



Modeling and Simulation of Fuel Cell Electric Vehicles

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Abstract:

Abstract - The objective of this paper is to develop a model for a fuel cell hydrogen vehicle driven by a brushless DC motor. A two leg directly coupled interleaved boost converter is used to power the motor from the fuel cell through a three-phase inverter. The studied system of the fuel-cell vehicle is designed and simulated using the commercial PSIM9 software. Due the presence of power converters, different harmonic components exist in the system, especially in the input voltage/current to the motor. The ripple contents of current and voltage at the fuel cell output and the motor input are estimated. An active power filter is designed in order to reduce the current and voltage harmonics of brushless DC motor. The instantaneous active and reactive current components i_d - i_q control method is used in this study to lessen the harmonic contents at the input of the Brushless DC motor to the standard values.

Keywords:

Fuel cell, BLDC motor, Interleaved boost converter, Active power filter and Hybrid vehicles.

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