

Abstract Details

Publishing Date: July 12, 2019

Title: Implementation for Modeling of Super Capacitors during Charge and Discharge for Electric Vehicles

Authors: Muskan Saroha and Devender Kumar Saini

Abstract: On increasing demand of electric vehicle, efficiency and performance plays a very vital role and it depends upon the energy storage system of EV. In this paper, a new battery super capacitor hybrid energy storage system is proposed to meet the requirement. For automotive applications, the batteries are sized to ensure many constraints like start up, acceleration, braking and energy recovery. All these constraints give us a very heavy battery with very high energy compared to that required for these applications. To reduce the weight of the storage system, the battery can be associated with high power component like super capacitor. It is one of the crucial tasks to improve both efficiency and performance of the electric vehicle regarding electric power density and energy capacity. Super capacitor integrates system by means of static power converter. These systems can be completely electric or by using Fuel cell. The MATLAB simulation is performed to evaluate its performance and investigate the mitigation of battery stresses. Simulation model of hybrid energy source is presented and used to investigate the design optimization of electric vehicle on board of energy source in terms of energy efficiency and storage mass. Introduction of super capacitor reduces electric stresses, increases efficiency and enhances the overall performance.

Keywords: Electric Vehicles, Super Capacitors, Charging and Discharging.