

Fuel Cell Super Hybrid Capacitor





Overview

Can a fuel cell/battery/supercapacitor hybrid power source be used in fchevs?

This study proposes a novel fuel cell (FC)/battery/supercapacitor (SC) hybrid power source to be utilized in FCHEVs. The power source includes a 90 kW proton exchange membrane fuel cell (PEMFC) stack used as the main power source and a 19.2 kW Lithium (Li)-ion battery together with a 600 F SC bank used as the auxiliary energy storage devices.

What are the advantages of hybrid fuel cells and supercapacitors?

Hybrid systems of fuel cells and supercapacitors avoid the above-described problems of rapid discharge or the inability to stand for high discharge rates. Indeed, the supercapacitor is responsible for powering the electric vehicle during high power-demand periods, and the fuel cell operates at medium or low power demand.

What is fuel cell/supercapacitor efficiency?

The efficiency allows the technician or user to determine the fuel consumption through the required energy for every segment. The simulation runs on specific technical data for the fuel cell/supercapacitor hybrid system. Table 4 shows the main parameters of the power battery for the electric vehicle.

Does a fuel cell/supercapacitor reduce energy consumption in electric vehicles?

The simulation results show an average reduction in energy consumption of 37% and 27.1% in vehicle weight, contributing to lower energy use. The study concludes that using a hybrid power system, a fuel cell/supercapacitor, instead of a battery in electric vehicles is beneficial, especially in journeys with frequent acceleration processes. 1.



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Control and Performance Assessment of Fuel Cell/Supercapacitor Hybrid

Mar 20, 2025 · Zhou Y et al (2021) A novel second-order sliding mode control of hybrid fuel cell/super capacitors power system considering the degradation of the fuel cell. Energy ...

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