

A battery charging system for intermittent generation from a synchronous generator with a novel maximum power point tracking control

ABSTRACT

This paper proposed a battery charging system for intermittent generation from a synchronous generator with a novel Maximum Power Point Tracking (MPPT) control method. Analyzing the generation with boost chopper by the state space averaging method, the internal voltage of the generator, the output voltage and the resistance of the output of the boost chopper can be estimated by with only single current sensor. Even though the intermittent generation, the proposed the battery charging system is able to charge the battery constantly because of a bi-directional DC/DC converter and an Electric Double-Layer Capacitor (EDLC). The basic principle of the proposed MPPT control method and the proposed charging system are discussed, and then confirmed by digital computer simulation using PLECS. The simulation results reveal that the proposed MPPT controller controls the maximum power point and the proposed charging system is able to charge the battery constantly.

Keyword: MPPT; State space averaging method; Boost chopper; Intermittent generator; Synchronous generator