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電動機車雙向變流器的設計與製作

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摘要

無刷直流機具有體積小、維護簡單、可靠性佳、高速控比之優點，目前已成為電動機車的主要選擇。在電池能量密度尚未提高以前，讓能量的使用發展到極至是延長電動機車行駛里程的方法。本文設計一種雙向變流器，電動機車行駛時，以 DSP TMS320F243 執行向量控制法則，控制雙向變流器讓無刷直流馬達完成速度控制。當機車減速時，讓無刷直流機當發電機使用，控制雙向變流器的再生剎車控制裝置，由煞車力發電，將電池再充電。

關鍵字: 無刷直流馬達;電動機車;雙向變流器,向量控制

Design and Implementation of a Bidirectional Converter for Battery-Powered Motorcycles

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Abstract

Nowadays, brushless DC motor is a main choice for the battery-powered motorcycles because it has the advantages of small size, easy maintenance, good reliability, and wide range speed control. Before the energy density of batteries can be increased, it is the path to extend travel mileage of battery-powered motorcycles by effectively using the energy of batteries. In this paper, a bidirectional converter for brushless dc motor is designed. A vector control approach is implemented by DSP TMS320F243 to control the bidirectional converter to get the speed control of brushless dc motor of battery-powered motorcycles in driving mode. In regenerative braking mode, the bidirectional converter is controlled to transfer the kinetic energy to the electric energy while decelerate the battery-powered motorcycles, so that the batteries can be charged.

Key words：Brushless DC motor;Electric motorcycle;

Bidirectional inverter;Vector control