

عنوان مقاله:

Predictive Direct Power Control Drive System of Doubly-Fed Induction Machine Fed by Indirect Matrix Converters

محل انتشار:

بیست و نهمین کنفرانس بین المللی برق (سال: 1393)

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خلاصه مقاله:

This paper presents a novel predictive Direct Power Control (DPC) for Doubly-Fed Induction Machine (DFIM) based on Indirect Matrix Converter (IMC), which is characterized by a simple structure, minimal power ripple and constant switching frequency. Nowadays, the control strategies based on predictive methods have proved their efficiency to improve drive systems capabilities. So, in this paper, one of the best predictive methods that has recently been suggested for DFIM drive systems, is applied to Indirect Matrix Converter. The purpose of this combination is modifying the control parameters and size / volume reduction of drive system structure which it is difficult to achieve in conventional systems based on VSI converters. By suitably selecting switching pattern, the strategy is able to improve the steady state and transient response behaviors of the machine. The good tracking behavior with reduced power ripple for the both motoring and generating modes as well as removing bulky electrolytic capacitor from dc-link of converter are resulted by using two active vectors plus one zero vector per switching period and apply these vectors to inverter stage of IMC. This paper investigates the use of four-step commutation in rectifier stage of indirect matrix converters to reduce losses and input currents waveform distortion caused by circuit snubber. Using this proposed strategy, the advantages of the DPC schemes and the benefits of the indirect matrix converters can be combined. In the inverter stage, the predictive DPC method is employed. The simulation results of proposed model confirm its effectiveness and accuracy.

کلمات کلیدی:

Doubly-Fed Induction Machine, Indirect Matrix Converter (IMC), Indirect Space Vector Modulation (ISVM), Predictive Direct Power Control

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