论文

基于DSP的空间矢量脉宽调制(SVPWM)的实现

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摘要：

根据电机的基本理论,详细分析了空间矢量的基本原理,提出了一种简单的空间矢量脉宽调制(space vector pulse width modulation, SVPWM)方法.该方法根据α-β复空间中的状态开关矢量,直接合成参考电压空间矢量,进行相关矢量作用时间的求取.计算量适中,实时性好,逆变器输出电流谐波小,电机转矩脉动小.本算法应用于以TMS320LF2407A为核心的感应电机变频调速系统中,实验结果表明,采用SVPWM技术的感应电动机变频调速系统实现简单,性能优越,改善了电机的运行品质,提高了逆变器的母线电压利用率.

关键词： 空间矢量脉宽调制　状态开关矢量　电流谐波

DSP based implementation of the space vector pulse width modulation

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Abstract:

According to the fundamental principle of motors, the space vector theory was analyzed, and a simple space vector pulse width modulation (SVPWM) method was proposed. The reference voltage space vector was directly synthesized based on the switching state vectors in α-β vectors complex space, and the duration time of each switching state vectors was calculated. The computational efficiency of this algorithm is moderate, and the real time performance is elegant. Thus the current distortions and torque ripples are lower in the output of the inverter. This given method has been applied to a control system of the three phase induction motor based on TMS320LF2407A. The test results showed that this control system with SVPWM has such merits as simple realization, improved running performance and an enhanced d.c. voltage utilization ratio.

Keywords: SVPWM　switching state vectors　current distortions

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