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**论文****基于最优马尔可夫链的双级四脚矩阵变换器随机载波调制策略**

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**摘要:**

为了抑制不平衡负载中的零、负序扰动, 提出一种基于载波调制的双级四脚矩阵变换器解决方案; 为了提高功率变换系统的综合性能, 提出一种基于最优马尔可夫链的随机载波四脚矩阵变换器调制策略。该调制策略是一种以随机过度矩阵为优化变量, 以开关次数和输出电压波形质量为综合优化目标的优化调制策略, 同时能一定程度地减轻电磁干扰问题。由于各性能指标的精确解析描述过于复杂, 采用一种近似描述的方法, 一方面能有效反映系统的真实性能, 另一方面极大简化了优化任务。仿真与实验结果验证了该方法的正确性。

**关键词:** 三维空间矢量调制 双级四脚矩阵变换器 随机载波调制 马尔可夫链 多目标优化**Chain Randomized Carried Modulation Strategy for Four-leg Matrix Converter Based on Optimal Markov**

SUN Yao, SU Mei, XIA Li-xun, WEI Ren-yong, GUI Wei-hua

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**Abstract:**

In order to reject the zero sequence and negative sequence disturbance due to unbalanced load, a solution using two-stage four-leg matrix converter based on carrier modulation strategy was proposed. In order to improve the comprehensive performance of power converter system, a randomized carried modulation strategy based on Markov chain for four-leg matrix converter was proposed. This modulation is an optimal randomized carried modulation strategy taking the random transient matrix as variables, and taking the output voltage waveform quality and switching times as optimized objectives. An approximate expression is used because of the complexity of performance index' s mathematic description, which, on the one hand, is able to reflect the real performance of the system; on the other hand, simplifies the optimization problem. This strategy has such advantages as less computation burden and easier realization compared with three-dimensional space vector modulation and reduced electro-magnetic interference. Simulation and experimental results verify the feasibility of the proposed method.

**Keywords:** three-dimension space vector modulation two-stage four-leg matrix converter random carrier modulation Markov chain multi-optimization

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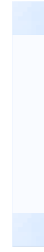
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