

A PV System with a Flying Capacitor Multilevel Topology with APOD and POD Pulse Width Modulation

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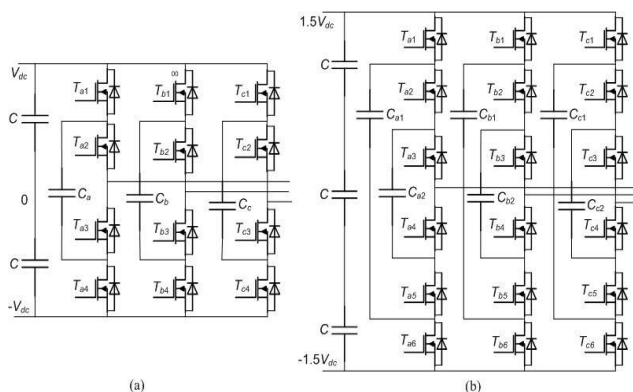
Abstract

This study of a three- and five-level flying capacitor multilevel inverter for a PV system uses phase disposition PWM and phase opposition phase disposition modulation approaches. The control approach of three and five level flying capacitor multilevel inverters uses the multicarrier PWM (MCPWM) techniques phase opposition disposition method. The three and five flying capacitor multilevel inverter is controlled in this study using the in phase disposition PWM controlling approach. MATLAB (2017) was used for the simulation, and the output voltage waveforms are recorded. Comparing the multilayer inverter to the cascaded H-bridge multilevel inverter, it is discovered that the multilevel inverter has less Total Harmonic Distortion (THD).

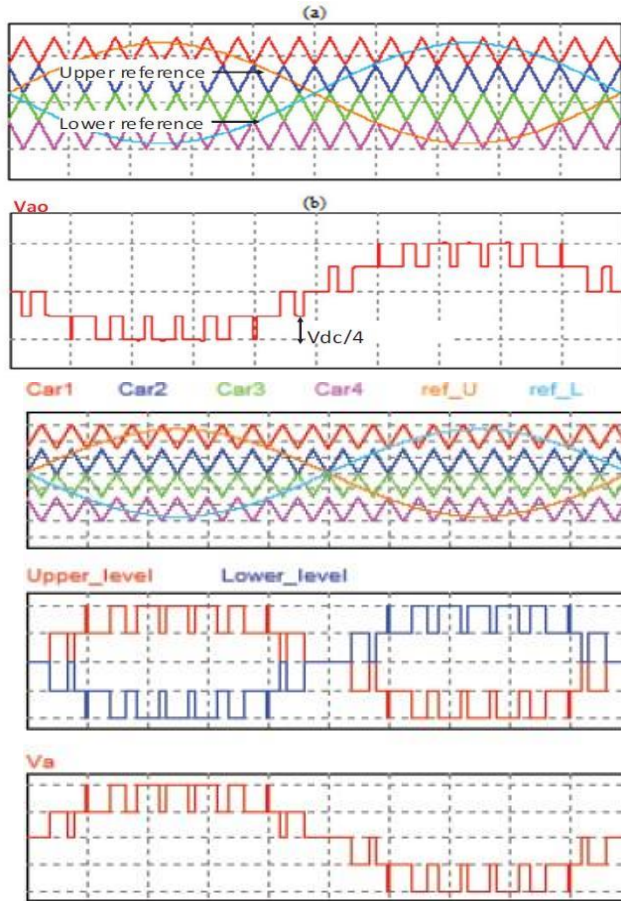
INTRODUCTION

The introduction of Multilevel inverters and the recent rapid growth of this new field have transformed power electronics [1]. There are several applications for this technology, including in industries [2]. Multilevel inverter technology is a rapidly evolving field that advances on a daily basis [3]. New iterations and variations of multilevel inverter technology have been noted frequently in recent literature. This paper's primary objectives are a review and an in-depth analysis of the rapidly evolving power electronic technology [4].

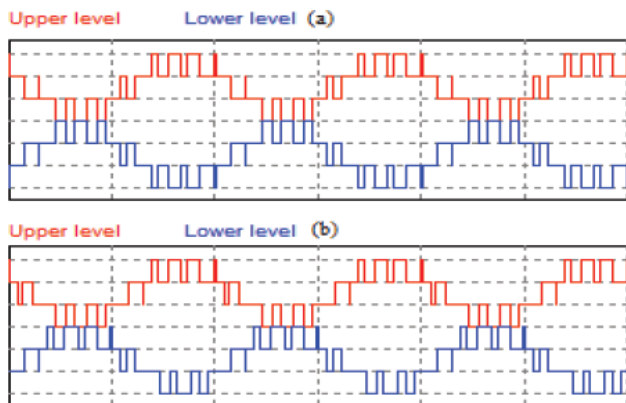
Flying capacitor multilevel inverter (a) three-level, (b) five-level.



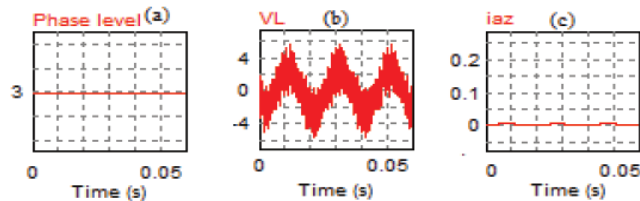
APODPWM, (N+1) modulation strategy;; N=4 a) carriers disposition b) Simple output voltage: 5 voltage levels



Upper and lower arms voltage levels a) PODPWMb)PDPWM



3-SM MMC converter leg characteristics a) Number of ON switch-ed SMs b) Inductor voltage c) circulating current



CONCLUSION

In this study, a 3-stage, 5-level fell is recreated.

With the help of the APOD and POD control approaches, a multi-level inverter has been put into practice in a simulation environment. The THD has been demonstrated by many Modulation indicators. We may conclude from the THD analysis that POD techniques have lower THD when compared to APOD. The THD increases for modulating indices from 0 to 1 and then decreases for both techniques after that. As a result, it can be inferred from the aforementioned simulation and its accompanying outcomes that POD will be the superior method over APOD.

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