

**SWITCHING TECHNIQUE COMPARISON FOR FIVE-PHASE
VOLTAGE SOURCE INVERTER**

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ABSTRACT

This report presents the comparison between three switching techniques for a five-phase voltage source inverter (VSI) using Space Vector Modulation (SVPWM) approach. Three different techniques which are based on large vectors, the combination of large and medium vectors, and the combination of large, medium, and zero vectors have been examined under a two-level five-phase inverter. The performance of these techniques are observed and evaluated in terms of harmonic contents for voltage waveform by employing MATLAB/Simulink software. Results from these techniques are compared and it can be observed that unwanted harmonic contents is produced in the auxiliary subspace (d3-q3) and embedded in the fundamental subspace (d1-q1). It can also be observed that the switching technique using combination of large and medium vectors has rapidly reduced the harmonic contents produced by d3-q3 subspace especially the 3rd and 7th harmonics order. Further reduction in the low order harmonic contents and phase-to-neutral voltages closer to sinusoidal waveform can be observed by implementation of zero vectors in the switching scheme.

Index Terms - Multi-Phase Drives, Space Vector Modulation (SVPWM), Voltage Source Inverter (VSI), Multiple d-q Subspaces

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