

Recent Advances in Pulse Width Modulation Techniques and Multilevel Inverters

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Abstract : This paper presents advances in pulse width modulation techniques which refers to a method of carrying information on train of pulses and the information be encoded in the width of pulses. Pulse Width Modulation is used to control the inverter output voltage. This is done by exercising the control within the inverter itself by adjusting the ON and OFF periods of inverter. By fixing the DC input voltage we get AC output voltage. In variable speed AC motors the AC output voltage from a constant DC voltage is obtained by using inverter. Recent developments in power electronics and semiconductor technology have lead improvements in power electronic systems. Hence, different circuit configurations namely multilevel inverters have become popular and considerable interest by researcher are given on them. A fast Space-Vector Pulse Width Modulation (SVPWM) method for five-level inverter is also discussed. In this method, the space vector diagram of the five-level inverter is decomposed into six space vector diagrams of three-level inverters. In turn, each of these six space vector diagrams of three-level inverter is decomposed into six space vector diagrams of two-level inverters. After decomposition, all the remaining necessary procedures for the three-level SVPWM are done like conventional two-level inverter. The proposed method reduces the algorithm complexity and the execution time. It can be applied to the multilevel inverters above the five-level also. The experimental setup for three-level diode-clamped inverter is developed using TMS320LF2407 DSP controller and the experimental results are analysed.

Keywords : five-level inverter, space vector pulse wide modulation, diode clamped inverter, electrical engineering

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