

MATHEMATICS INVOLVED IN SPACE VECTOR MODULATION TECHNIQUE OF THREE PHASE INVERTER

Y.K.KANSE, B.V.BARBADEKAR AND S.S.PATIL

Abstract

Sinusoidal PWM was a very popular technique used in AC motor speed control. This method employs a triangular carrier wave modulated by a sine wave and the points of intersection of these waves determine the switching points of the power devices in the inverter ckt .This method is not able to make full use of the inverter's supply voltage and the asymmetrical nature of the PWM switching characteristics produces relatively high harmonic distortion and poor quality wave form in the supply [3]. Space Vector PWM (SVPWM) is a recently developed technique for generating sinusoidal wave that provides a higher voltage to the AC motor which improves the efficiency ,have less inertia ,smaller volume ,less cost and lower total harmonic distortion., it is also compatible for use in vector control (Field orientation) of AC motors. AC motors can be used for long time without maintenance and are operated at higher speeds, higher torque and larger power ratings .A mathematics involved in three phase space vector modulation technique along with the comparison of PWM & SVM technique is presented in this paper.

Keyword: Space vector modulation (SVM), pulse width modulation (PWM), Sinusoidal pulse width modulation (SPWM), voltage source inverter (VSI), Space Vector PWM (SVPWM)