

## Space Vector Pulse Width Modulation Based Design and Simulation of a Three-Phase Voltage Source Converter Systems

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**Abstract :** A space vector based pulse width modulation control technique for the three-phase PWM converter is proposed in this paper. The proposed control scheme is based on a synchronous reference frame model. High performance and efficiency is obtained with regards to the DC bus voltage and the power factor considerations of the PWM rectifier thus leading to low losses. MATLAB/SIMULINK are used as a platform for the simulations and a SIMULINK model is presented in the paper. The results show that the proposed model demonstrates better performance and properties compared to the traditional SPWM method and the method improves the dynamic performance of the closed loop drastically. For the space vector based pulse width modulation, sine signal is the reference waveform and triangle waveform is the carrier waveform. When the value of sine signal is larger than triangle signal, the pulse will start producing to high; and then when the triangular signals higher than sine signal, the pulse will come to low. SPWM output will change by changing the value of the modulation index and frequency used in this system to produce more pulse width. When more pulse width is produced, the output voltage will have lower harmonics contents and the resolution will increase.

**Keywords :** power factor, SVPWM, PWM rectifier, SPWM

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