Abstract

The basic scheme presents a contribution for detailed comparative analysis between Field-Oriented Control and Direct Torque Control techniques for high performance induction motor drive. The torque and flux are controlled simultaneously by applying suitable voltage vectors, and by limiting these quantities within their hysteresis bands, de-coupled control of torque and flux can be achieved. This paper presents the evaluation technique of space vector modulation applied to the induction machines. The simulations were carried out using MATLAB/SIMULINK simulation package. Evaluation is made based on the drive performance, which includes dynamic torque and flux responses, feasibility and the complexity of the
systems. However, the basis of DTC SVM strategy is the calculation of the required voltage space vector to compensate the flux and torque errors exactly by using a predictive technique and then its generation using the Space Vector Modulation. We can note a slight advance of DTC scheme compared to FOC scheme regarding the dynamic flux control performance and the implementation complexity. The choice of one or the other scheme will depend mainly on specific requirements of the application.

References

- F. Parasiliti, "Appunti delle lezioni di Azionamenti Elettrici: Controllo Vettoriale e Orientamento di Campo" Università degli Studi di L'Aquila
- Satoshi Ogasawara, Hirofumi Akagi, Akira Nabae, "A novel PWM scheme of Voltage Source Inverters based on Space Vector Theory", EPE Aachen 1989

Index Terms

Computer Science          Vector Modulation
Keywords
Induction Motor  Field Oriented Control (foc)  Direct Torque Control (dtc)  Sensorless Space Vector Pulse Width Modulation (svpwm).