

DIRECT TORQUE CONTROL OF INDUCTION MOTOR USING SPACE VECTOR MODULATION

VINOD R. KAMALE AND S.P. MULEY

Abstract

Direct Torque Control is a control technique used in AC drive systems to obtain high performance torque control. The conventional DTC drive contains a pair of hysteresis comparators, a flux and torque estimator and a voltage vector selection table. 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. The DTC requires the flux and torque estimator. The reference voltage vector is then realized using a voltage vector modulator. The work of this project is to study, evaluate and compare the various techniques of the DTC-SVM applied to the induction machines. Evaluation is made based on the drive performance, which includes dynamic torque and flux responses, feasibility and the complexity of the systems. A simulation program has been developed to verify the results. The inverter duty cycle can then be calculated using the space vector PWM technique. The proposed method is very promising for rapid torque control which is quite different from FOC (Field Orientation Control).

Keywords: Space vector, Torque & flux controller & estimator, motor drives.