

DESIGN AND SIMULATION OF SENSOR-LESS CONTROL OF INDUCTION MOTOR

ABSTRACT

There are so many speed control techniques available, like Scalar control, Vector control, sensor less control etc. Due to coupling effect, the Scalar control has inferior performance and Vector control is a method of speed control in which both magnitude and phase angle of current can be controlled. In Vector control, the presence of speed sensor at shaft decreases the reliability and ruggedness.

The latest development in induction motor speed control is the Sensor less control technique. Controlled ac drives in the case of 'Sensor less control' without mechanical sensors for speed (or) motor shaft position have the attraction of lower cost and high reliability. With the sensorless speed control technique the speed information is obtained without the use of speed or position sensor. This is major advantage since the speed sensors have several disadvantages. However, the feedback information is still needed and is generated through indirect technique such as 'estimation'.

In this project work motor model in stationary reference frame is proposed. The motor model in stationary reference frame is simple, accurate and less sensitive to the motor parameters compared to the rotating reference frame model. The proposed method, having the speed estimation by using Model Reference Adaptive System (MRAS), which will give satisfactory operation in low speed region also. In our thesis simulation of sensorless control of induction motor using MRAS Technique have been carried out by using Matlab/Simulink. The results obtained in this method are in good agreement with same as that of vector control. Hence, the sensorless control is economical and more reliable compared to vector control, and speed variation can be obtained very smoothly. By using this method speed variation is very low at low speeds as well as at high speeds.