Abstract

DC drives had always the advantages over AC drives initially because the former offered reliable torque and speed control but AC drives could not. The torque oscillations and sluggish response inherent in the prevailing AC drive technology was unacceptable for high performance applications. The good response of DC drives has been attributed due to the independent field and armature control possible in a DC machine, while AC machines were considered only in constant speed applications.

With an advance in the fields of power electronics and power semi-conductors devices better algorithms could be developed for the control of AC machines. Beside that the development of field oriented control theory for induction motor enables to get the user the same response that was achieved with dc machine. The advances made in the field of microprocessors enabled software implementation of both inverter control and field orientation control algorithms. The result was field-oriented control for AC machines often-called "VECTOR CONTROL". After the development of vector control, the sensorless vector has been developed where speed and torque are calculated by sensing the motor current and voltage. For the calculation of speed and torque in sensorless vector control accurately, motor parameters should be identified with a high accuracy.

This report demonstrates the parameter identification technique in which the system itself determines all electrical parameters of the induction machine necessary for the operation of vector controlled induction motor drive. The proposed AUTO TUNING scheme utilizes the inverter itself and its own software routines to estimate the machine parameters. So if the inverter and machine are not supplied from the same manufacturer, or if the machines windings have been rewinded after maintenance, the proposed method is very useful to estimate all the parameters necessary for the vector control operation.