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Abstract:

This paper presents speed and direct torque controllers based on fuzzy logic for a space vector modulated pulse width modulated inverter fed induction motor. The direct torque control has been designed by decoupling the torque and flux based on the energy model of induction motor. The designed direct torque control system can be accomplished by using constant switching frequency with space vector modulated pulse-width modulated inverter. In order to control the speed of induction motor conventional PI controller has been used in industrial applications due to its simplicity. Traditional PI controller does not meet the requirement (such as minimize the overshoot, steady-state error, robustness under the variation of load disturbance and parameters) for high performance induction motor. In this paper two fuzzy logic controllers are developed to control the torque and speed of an induction motor. The fuzzy logic controllers are designed using the energy model of induction motor. The drive is simulated successfully using Matlab/Simulink to verify the performance of designed fuzzy-logic controllers. The performance of the drive has been examined under various working conditions. The simulation results show that the proposed fuzzy logic controllers work satisfactorily making the drive more suitable for high performance applications.

Keywords: Direct-torque control, fuzzy logic control, speed control, energy model, induction motor, space-vector pulse-width modulation