

Abstract :

This paper presents an experimental investigation of induction motor state estimation based on the combining of sliding mode and Lyapunov's second function principles. For this purpose, the induction motor drive is built using the standard direct torque control and the state estimation is based on speed-sensorless sliding mode observer. The proposed scheme gives more robustness to the drive compared to other conventional voltage or current based techniques. Moreover, a hyperbolic function with adjustable slope is introduced in order to cover chattering effects. The stability analysis of the proposed observer is heavily demonstrated based on the concept of Lyapunov's second method. The merits and feasibility of the whole algorithm are verified by experimental results using a TMS320F240 digital signal processor.