Abstract

In this paper, a backstepping controller of Induction Motor (IM) is proposed using the fifth order model in fixed two frame reference axis with rotor flux and stator currents as state variables. The approach of backstepping requires, generally, that the nonlinear system is in strict feedback loop. To implement this strategy over the IM, some transformations on the model (α, β) of the machine have been carried out without recourse to the oriented flux hypothesis which
allows a triangular state representation. The overall system stability is proved by Lyapunov theory. Indeed the controller relationship depends on the unmeasured states of the IM, and a nonlinear observer to high gain is used in order to reconstruct the motor speed, the rotor flux and the load torque. Simulation results are provided to illustrate the effectiveness of the proposed approach and the robustness to uncertainties, such as rotor resistance variations.

Reference

Key words

Backstepping control	induction motor	high gain
observer