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GENERAL THEORETICAL SOLUTION OF SENSORLESS SPEED-FLUX VECTOR CONTROL OF INDUCTION MOTOR

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Abstract

A novel speed sensorless control for the full order model of induction motors with unknown constant load torque is presented. The proposed nonlinear controller exploits the concept of direct field orientation in combination with a reduced-order adaptive speed observer based on the torque current dynamic. It guarantees local asymptotic tracking of smooth speed and rotor flux reference trajectories, asymptotic field orientation, and asymptotic speed estimation with local exponential stability properties. The developed solution can be used for industrial electromechanical systems since no significant simplifying assumptions are used. Experimental

tests confirm theoretical results and show that the proposed controller is suitable for medium performance applications. References 10, figures 4.

Key words: induction motor, sensorless control, sliding mode, equivalent control method.

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