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Real Implementation of Advanced Strategies for Vector Control of Induction Motors

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ABSTRACT

This paper documents the work carried out to investigate and analyze a number of open problems in speed control of induction motors. The work involves theoretical and simulation studies, as well as hardware design, implementation and experimental results. The hardware is based on Digital Signal Processing (DSP) technology which allows flexible implementation of advanced control strategies in real-time. Various aspects of induction motor control were studied, including simulations of vector control, speed sensorless control, advanced input-output decoupling and nonlinear flux observers. In addition, a number of algorithms were implemented and experimentally evaluated on the hardware rig, designed as part of the paper. These include Field Oriented Control and speed-sensorless vector control. A number of relevant conclusions connected with induction motor control are presented.

Keywords: Induction Motors, Vector Control, Field Oriented Control.