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Estimation of speed in linear induction motor drive by MRAS using neural network and sliding mode control

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Abstract: The paper proposes a speed observer for a linear induction motor drive, which uses artificial neural network model reference adaptive system (NN-MRAS) that uses sliding mode control. The basic mathematical equations of the motor governed by the voltages and currents from the equivalent circuit of the motor including the end effects are determined. The artificial neural network (ANN) model based adaptive system in MRAS for the secondary of the motor is developed. The sliding mode control is implemented with the NN-MRAS model. The dynamical response and speed observation is compared for the conventional MRAS using PI control and the NN-NRAS with sliding mode control model for the induction motor drive by simulation using Matlab/Simulink.

KEY WORDS: Indirect vector control, linear induction motor, MRAS, artificial neural network, sliding mode control.