Title:	Speed Control and a Full-Order State Observer for Efficiency Optimized Induction Motor
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Abstract:
To improve the efficiency of an induction motor (IM), an algorithm has been developed in terms of slip frequency. A discrete-time multi-input and multi-output (MIMO) optimal regulator is proposed to achieve the desired speed with efficiency optimization. Furthermore, a full-order observer is proposed to estimate rotor flux and magnetizing current because these states of IM are feedback to design the proposed controller. The performances of the efficiency optimized speed control and observer system have been verified by simulation. Regarding the simulation study, it can be stated that the proposed controller and observer system are suitable for the implementation of efficiency optimized speed control of IM.

Keywords: Core loss, Efficiency optimization, Full-order observer, Induction motor, Optimal regulator, Speed control