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Abstract:
The state space model of an induction motor (IM) in a synchronously rotating reference frame behaves as a bilinear system due to the products of state variables and inputs. Thus, it is desirable to design an observer based on bilinear observer theory. This article deals with the design of a reduced order bilinear observer to estimate the rotor flux of IM. The observer can provide stable performance because the gains of observer are calculated by using the Lyapunov stability theory. The proposed observer can be applied with any regulator to control speed and flux of IM since the convergence of error of observer system is completely independent of input variables. Therefore, a multi-input and multi-output (MIMO) optimal regulator is associated with the proposed observer to track the desired speed and flux of IM. The effectiveness of the proposed observer is verified by simulation that is performed by using Matlab/Simulink.