Title:	High Performance Control for SVPWM Inverter-Fed Induction Motor with Core Loss Consideration
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Published Journal Name:	American Academic & Scholarly Research Journal
Type of Publication:	Journal
Volume:	5 Issue 1
Publisher:	American Academic & Scholarly Research Center
Publication Date:	January 2013
ISSN:	2162-3228
URL:	https://aasrc.org/aasrj/index.php/aasrj/article/view/679
Other Related Info.:	Page 135-143

Citation: Mohammad Abdul Mannan, "High Performance Control for SVPWM Inverter-Fed Induction Motor with Core Loss Consideration", American Academic & Scholarly Research Journal, Vol. 5, No. 1, pp. 135 – 143, Jan. 2013.

Abstract:

The actual flux and torque of a field-orientated control (FOC) induction (IM) differ from the reference flux and torque due to the effects of core loss. Thus, it is desirable to design a controller to achieve desired speed and flux taking core loss into account. Moreover, it is also desirable to design an observer to estimate states of IM properly since the states of IM are increased with consideration of core loss. Therefore, in this paper speed and flux controller, and a full-order observer for space vector pulse width modulation (PWM) inverter fed IM taking core loss into account are designed based on discrete-time proportional and integral (PI) controller. The effectiveness of proposed discrete-time PI controller and observer systems are verified by simulation. The simulation results confirmed that the proposed controller can properly track the reference speed and flux and the proposed observer can properly estimate the state quantities of IM taking core loss into account.

Keywords: Induction motor, Core loss, Speed and flux control, PI controller, Observer, pole placement technique, Space vector PWM inverter.