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## Abstract:

Speed control of the electrical drive is very important to accelerate productivity, quality and to minimize energy consumption as well as equipment maintenance. Interior permanent magnet synchronous motor (IPMSM) is one of the best candidates for electrical drive systems because of its simplicity, smaller size and higher gap flux density. This paper deals with the design and simulation of speed control of IPMSM core loss taking into account. The decoupling control strategies of torque and flux have been developed by using the field oriented control (FOC) strategy. In order to control speed of IPMSM using the PI controller, the terminal voltage and frequency have to be varied which can be achieved by using the sinusoidal pulse-width modulated (SPWM) inverter. The efficacy of design control system is verified by the simulation work which has been done by using Matlab/Simulink software. The simulation studies on various operating conditions of IPMSM showed that the good response of desired speed even under the variation of load torque.

**Keywords:** Interior permanent magnet synchronous motor, Core loss, Flux oriented control, Sinusoidal pulse width modulation, PI controller.