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Abstract:

Consideration of core losses and stray load losses to design a controller of an inverter fed induction motor are affected to the flux and torque decoupling strategy adversely. As a consequence, the detuning of field-oriented control (FOC) is required. The detuning strategies have been developed in some literatures. But the implementation of detuning becomes difficult because of higher order expression. In general, the controlling and estimation of AC drives are considerably more complex than those of DC drives. This complexity increases substantially if high performances are demanded. The main reasons for this complexity are the need of variable frequency, harmonically optimum converter power supplies, the complex dynamics of AC machines, machine parameter variations, and the difficulties of processing feedback signals in the presence of harmonics. To avoid the detuning strategies and to minimize the overshoot and steady state error problems which occur while using a conventional PI controller, the decoupling control strategies with integral plus proportional controller have been proposed in this paper.

Keywords: induction machine, core loss, stray loss, IP controller, inverter