Abstract

Shunt-excited doubly salient 8/6-switched reluctance machine

The performance of a doubly salient 8/6-switched reluctance motor using a shifted fully pitched winding configuration is investigated. The self and mutual inductance characteristics of the machine windings are fundamental to torque generation and are therefore evaluated both theoretically and experimentally. Finite element analysis has been used to investigate theoretical motor-torque capability. Simulation and experimental results for different commutation schemes and their corresponding torque waveforms are investigated for low levels of torque and at low speed. Experimental results are presented for the operation of the machine up to full-load torque. A simple DC rail voltage boosting circuit is shown to enhance the current-control capabilities of an IGBT-based converter. The possibility of driving the machine using a two-switch power converter is also discussed