Abstract

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A Novel power converter with voltage boosting capacitors for a four phase SRM drive

This paper presents a method of enhancing the performance of a four phase switched reluctance motor by using capacitors to produce additional supply voltage during the rise and fall periods of a motor phase current. The voltage rating of the inverter components increases and extra capacitor/diode combinations are needed. The operation and analysis of a series voltage boost circuit are detailed for different modes of operation with a study of the effect of the boost capacitor voltage on the current waveform. Different voltage boost circuit configurations are compared. The predicted and measured results show that the boost circuit increases both torque and output power and, improves the efficiency of the machine, especially at high speeds.