

Comparative Analysis of DTC Based Switched Reluctance Motor Drive Using Torque Equation and FEA Models

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Abstract : Since torque ripple is the main cause of noise and vibrations, the performance of Switched Reluctance Motor (SRM) can be improved by minimizing its torque ripple using a novel control technique called Direct Torque Control (DTC). In DTC technique, torque is controlled directly through control of magnitude of the flux and change in speed of the stator flux vector. The flux and torque are maintained within set hysteresis bands. The DTC of SRM is analysed by two methods. In one of the methods, the actual torque is computed by conducting Finite Element Analysis (FEA) on the design specifications of the motor. In the other method, the torque is computed by Simplified Torque Equation. The variation of peak current, average current, torque ripple and speed settling time with Simplified Torque Equation model is compared with FEA based model.

Keywords : direct torque control, simplified torque equation, finite element analysis, torque ripple

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