Fault Tolerant High Frequency Pulse Injection Method for Sensorless Operation of SRMs

In this paper a high frequency pulse injection method for sensorless operation of switched reluctance motors is introduced. This method is tolerant towards common faults such as eccentricities. In the proposed scheme, a generalized trend is established for the injected pulses. Via monitoring the predefined trend for the pulses proper angle for energizing the phases is diagnosed. In previous strategies a certain threshold is determined for the pulses which shows the position for energizing the next phase but as a result of faults such as eccentricities the magnitude of the pulses may alter an the predefined thresholds may be useless and consequently the operation of the motor will be marred. In this paper, the magnitude for the pulses is not important but the overall trend for the magnitude of pulses is considered for the best criterion of phase sequential energizing. Furthermore, an external resistance is added to the diagnostic inactive phase during pulse injection which helps to adjust exactly the best advancing angle to minimize torque ripple. Using finite element method a 4/6 SRM is established for both healthy and faulty conditions. Several look up tables are derived from these models which are employed to generate Matlab/Simulink models. Various simulations demonstrate desired operation of the suggested method under healthy and 30% eccentricity fault conditions.

Key Words: Switched Reluctance Motor, Eccentricities Faluts, Sensorless Rotor Position Estimation, High Frequency Pulse Injecton, Inductance Curve

این صفحه به معنای تاییدیه نمایه سازی مقاله در پایگاه استندادی سیویلیکا می‌باشد. در هر لحظه به منظور تایید اصلاحات این گواهی می‌توانید وضعیت ثبت مقاله را از طریق لینک فوق به صورت آنلاین کنترل نمایید.