عنوان مقاله:

Automatic Phase Advancing in Switched Reluctance Motor by Employing an Electronic Governor for a Desired Speed Angle Profile

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خلاصه مقاله:

Switched reluctance motor (SRM) drive has remarkable characteristics that make it attractive for high-speed applications. As the motor's speed increases the shape of the current waveform changes in such way that limits the production of motoring torque. At high speeds, it is possible for the phase current never reaches the desired value due to the self e.m.f. of the motor, therefore, the torque falls off. In order to remedy this problem, the phase turn on angle is advanced in such way that the phase commutation begins sooner. Advancing the commutation angle offers the advantages of getting the current into the phase winding while the inductance of the phase is low, and also of having a little more time to get the current out of the phase winding before the rotor reaches the negative torque region. Since the SRM drive is a variable speed motor then, the amount of advancing for the turn on angle should be accomplished automatically according to the speed of the motor, meaning, as the motor speed increases so should the turn on angle and vice versa. In this respect, this paper introduces an electronic governor using a P.L.L. module in conjunction with a micro controller to achieve this task for a desired speed/advancement angle profile, which is considered to be linear in this study. The governor causes ۰-۱۴ degrees automatic adjustment in the turn on angle from stand still to a pre-set speed for a SR motor. A linear analysis of the current waveform for the motor under different advancements of the turn on angle has been performed and the plots are shown. Finally, the experimental results of employing the governor on a ۶ x ۴ SRM drive are presented.

کلمات کلیدی:

Switched reluctance motor, SRM, Switched Reluctance Drive, Motors, Electronic Governor in SRM