

TORQUE RIPPLE MINIMIZATION OF BLDC MOTOR BY USING HYSTERISIS CURRENT CONTROLLER

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ABSTRACT

This paper proposes a method of minimization of torque ripple in Brushless DC (BLDC) motor with ideal back EMF under MATLAB 7.1/Simulink environment. An idealized BLDC motor has trapezoidal back EMF waveform. However, for practical reasons like non-uniformity of magnetic material and design parameters it is difficult to produce exact trapezoidal wave shape. Therefore torque ripple appears in conventional control. This paper, introduces the Hysteresis Current Control (HCC) method to minimize the torque ripple at commutation period. Hysteresis controller averages the incoming and outgoing phase current to minimize the dips and spikes in un-commutated phase current. This leads to minimize the torque ripple. Simulation results shows the apparent reduction in torque ripple when compared with conventional control.

KEYWORDS: Brushless DC Motor (BLDC), Torque Ripple, Commutation, Hysteresis Current Control