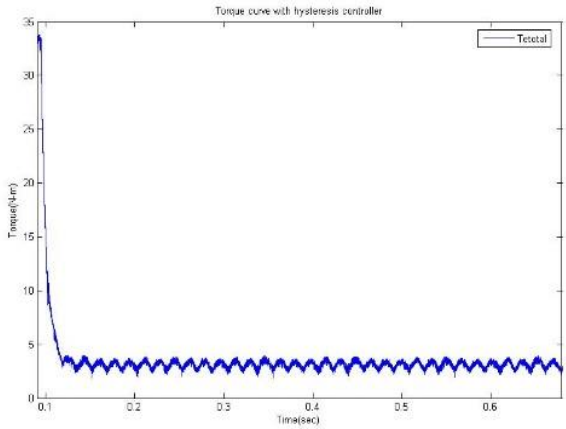

Figure 14. Torque curve of BLDCM with Hysteresis controller

In the below curve:
(1) Peak to peak and average torque is $T_{P\text{-}P}$=0.9, T_{AV}=2.992.
(2) Peak-peak ripple torque = (3.4-2.5) =0.9 N-m
(3) Average torque = 2.992N-m
(4) %Torque ripple = 0.9*100/2.992
= 30.0815 %(approx)

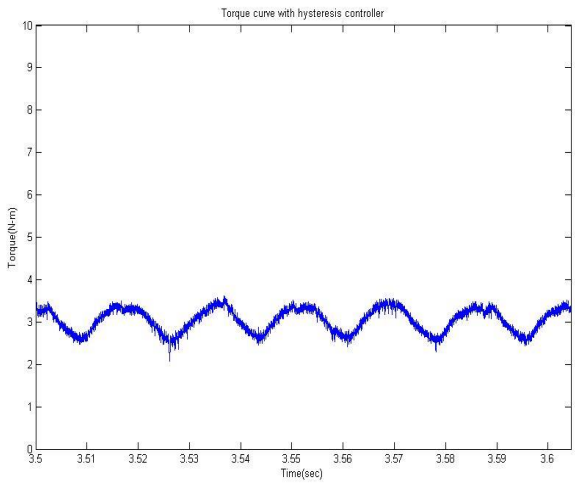

Figure 15. Torque curve of BLDCM with Hysteresis controller under steady state

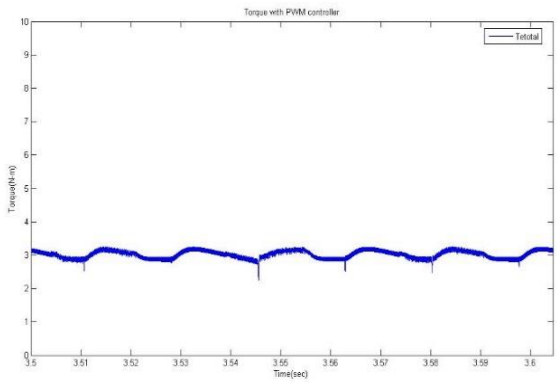

Figure 16. Torque curve of BLDCM with PWM controller under steady state

From the fig16:
(1) Peak to peak and average torque is = (3.2-2.8)
= 0.4 N-m
(2) Average torque = 3.033 N-m
(3) % Torque ripple=0.4*100/3.033 = 13.188% (approx)

4. CONCLUSIONS

In this paper, the Hysteresis current and PWM controllers of BLDC motor are presented with Simulink/Matlab model. The output of hysteresis controller, which reduces the motor torque ripples to 30% when compared to without controller. The BLDCM with PWM controller the torque ripples still reduced to 13.18% . The PWM controller improves the torque performance over hysteresis current controller. So the PWM controller reduces the motor torque ripples as required in the industries. So this controller is applicable for most industrial applications.

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