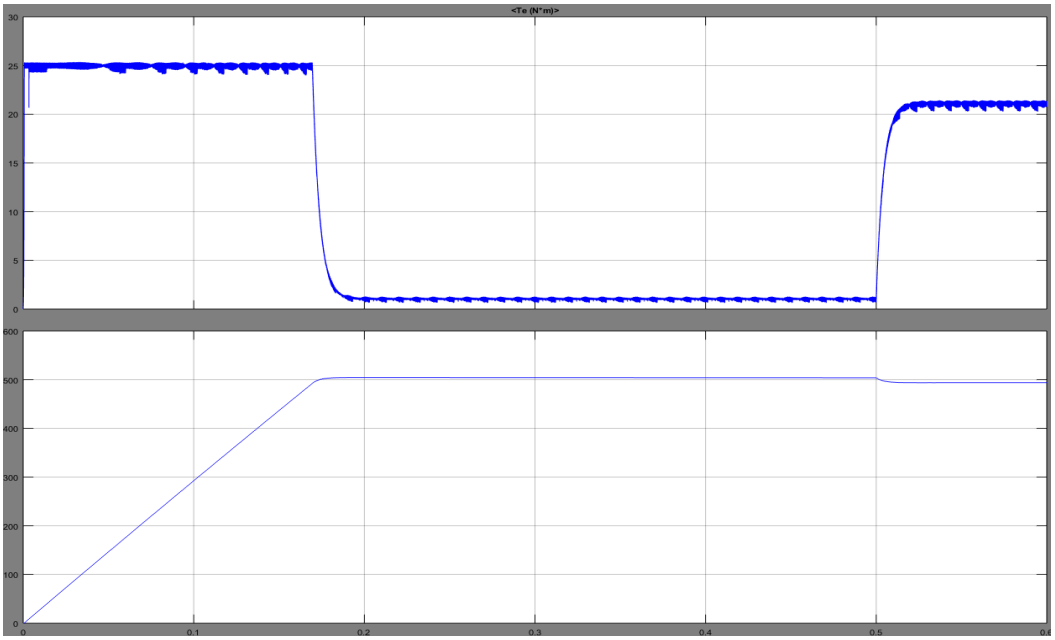

Fig. 10(b) Total torque and speed response for speed reference equal to 500 RPM and load torque of 20N.m applied at t=5sec

In Fig.10 (a) and Fig.10 (b), the load torque of 20Nm is applied at t=0.5 sec, motor torque increases gradually and there is small increase in current. However, with this application of load, motor torque remains within the hysteresis limit thus torque ripple remains within acceptable limit irrespective of load applied.

IV. CONCLUSIONS

This paper proposes a torque controller for minimizing the torque ripple in Switched Reluctance motor. The Drive with DTC Controller is simulated using MATLAB/SIMULINK for stator flux reference equal to 0.3 Wb. In this method, torque and torque ripple is directly controlled through the control of the magnitude of the flux linkage and the change in speed of the stator flux vector. From simulation result it is observed that the flux and torque are maintained within set hysteresis band both during acceleration and steady state conditions.

REFERENCES

[1] C. Yong Kwon, Y. Hee Sung, and K. Chang Seop, "Pole-Shape optimization of a switched-reluctance motor for torque ripple reduction," *IEEE Trans. Magn.*, vol. 43, no. 4, pp. 1797-1800, Apr. 2007.

[2] N. K. Sheth and K. R. Rajagopal, "Optimum pole arcs for a switched reluctance motor for higher torque with reduced ripple ," *IEEE Trans. Magn.*, vol. 39, no. 5, pp. 3214-3216, Sep. 2003.

[3] N. C. Sahoo, J. X. Xu, S. K. Panda, "Low torque ripple control of switched reluctance motors using iterative learning," *IEEE Trans. Energy Conversion*, vol. 16, no. 4, pp. 318-326, Dec. 2001.

[4] (2002) The IEEE website. [Online]. Available: http://www.ieee.org/

[5] Adrian Dravid Cheok and Yusuke Fukuda, "A New torque and flux control method for switched reluctance motor drives," *IEEE Trans. Power Electronics*, vol. 17, no. 4, pp. 543-557, Jul. 2002.

[6] B. H. Jeong, K. Y. Lee, J. D. Na, G. B. Cho and H. L. Baek, "Direct Torque Control for the 4-phase Switched Reluctance Motor Drives," *in Proc. ICEMS, 2005*, pp. 524-528.

[7] T. J. E. Miller and M. McGilp, "Nonlinear theory of the switched reluctance motor for rapid computer-aided design," *in Proc. Inst. Elect. Eng. B, vol.137*, pp. 337-347, June 1990.

[8] G. Gallegos-Lopez, P. C. Kjaer, and T. J. E. Miller, "A new sensorless method for switched reluctance motor drives," *IEEE Trans. Ind. Application*, vol. 34, 4, pp. 832-840, Jul/Aug. 1998.

[9] N. H. Fuengwarodsakul, M. Menne, R. B. Inderka and R. W. DeDoncker, "High- dynamic four-quadrant switched reluctance drive based on DITC," *IEEE Trans. Ind. Appl.*, vol. 41, no. 5, pp. 1232-1242, 2005.

[10] Iqbal Husain and Syed A. Hossain, "Modeling, Simulation, and Control of Switched Reluctance Motor Drives," *IEEE Trans. Industrial Electronics*, vol. 52, no. 6, Dec. 2005.

[11] Vladan P. Vujicic, "Minimization of Torque Ripple and Copper Losses in Switched Reluctance Drive," *IEEE Trans. Power Elec.*, vol. 52, no. 6, Dec. 2005.

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