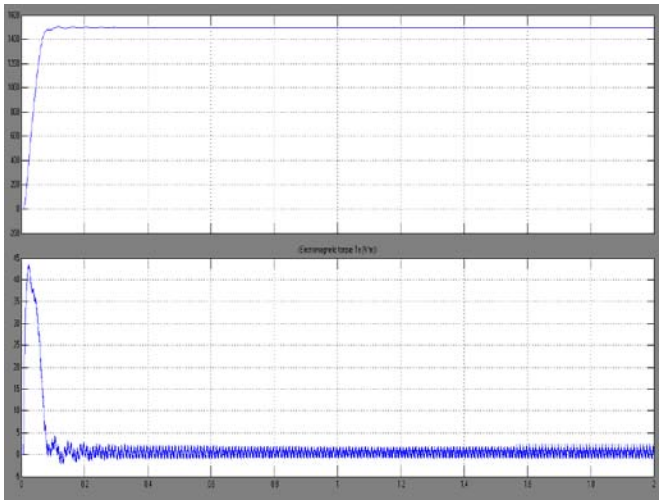

Figure 9: Speed and Electromagnetic torque of induction motor under PD PWM technique.

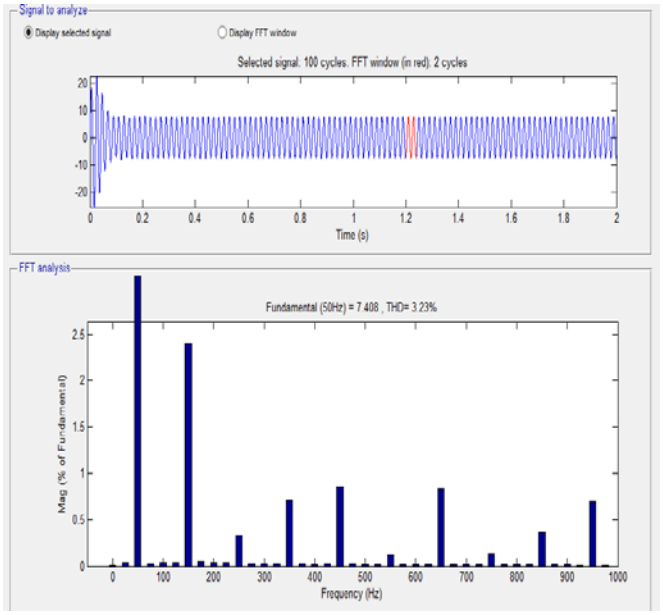

Figure 10: THD % of stator current under PD PWM technique.

Figure 7 and 10 shows the THD % of stator current under APOD and PD PWM technique of induction motor. It is clear about THD % is low in PD technique, but 3rd harmonic is high. Now THD % is high in APOD technique compare to PD, but 3rd harmonic low.

Table 1: Comparison of APOD and PD PWM technique current THD% and Harmonic

Technique	THD%	3rd Harmonic	5th Harmonic	7th Harmonic
APOD	4.18%	0.54%	0.03%	0.11%
PD	3.23%	2.40%	0.33%	0.71%

4. Conclusion

The SPWM control strategy method for three phase fifteen level cascaded H bridge multilevel inverter fed induction motor has been presented in this paper. The carrier based disposition of PDPWM and APODPWM method have simulated and results have been tabulated. The PDPWM method has given the better THD% than APODPWM, but 3rd, 5th and 7th harmonics content is low in APODPWM technique. APODPWM technique is better for induction motor under speed and torque. The simulation of fifteen level cascaded H bridge multi level has been designed and simulated as MA TLAB / Simulink environment.

References

[1] B.P.Mcgrath and D.G Holmes "reduced n PWM harmonic distortion for multi level inverters operating over a wide modulation range" IEEE Transactions on power electronics vol 21 no 4 pp94 1-949, july 2006
[2] G. Carrara, S. Gardella, M. Marchesoni,R. Salutari, G. Sciutto, "A New MultilevelPWM Method: A Theoretical Analysis," IEEETransactions on Power Electronics, vol. 7, no. 3,July 1992, pp. 497-505.
[3] Leon M.Tolbert and Thomas G. Habetler "Novel multilevel inverter carrier based PWM method" IEEE Transaction On Industry Application Vol 35 No 5 Sep 1999 pp 1098-1107
[4] Aglidis and M.Calasis "Application specific harmonic performance evaluation of multi carrier PWM techniques" in IEEE PESC, pp 172-178
[5] lRodriguez, J.S.Lai, and F. Z.Peng,"Multilevel Inverters: A Survey ofT opologies, Controls, and Applications", IEEETransactions on Industrial Electronics, Vol. 49,No. 4, August 2002,pp.724-739
[6] H.Y Wu, X.N He "Research on PWM control of cascade Multilevel converter" Proc of the Third International conference on Power Electronics and Motion Control, pp 1099- 1103, 2000.
[7] B.P.Mcgrath and D.G Holmes "Multi carrier PWM strategies for multilevel inverter" IEEE Transaction on Industrial Electronics, Volume 49, Issue 4, Aug 2002, pp 858-867
[8] Martha Calais, Lawrence lBorlel Vassilios G. Agelidis "Analysis of Multi carrier PWM Methods for a single phase five level inverter" IEEE Transaction on Power electronics , July 2001,pp 1351-1356
[9] D.GHolmes, and B.P.McGrath,"Opportunities for Harmonics cancellation with Carrier based PWM for Two level and multilevel cascaded inverters," in confRec.IEEE/IAS Annual Meeting, 1999.
[10] Tianhao Tang, Jingan Han, Xinyuan Tan, "Selective Harmonic elimination for a cascaded multilevel inverter " IEEE Transation on Industrial Electronics,2006 IEEE international Symposium,volume2, July 2006, pp997-98I
[11] D.Mohan and Sreejith B.Kurub "Performance Analysis of Multi Level Shunt Active Filter based on SDM" in CiiT International Journal of Digital Signal Processing pp42 - 46
[12] Villanueva, E. Correa, P. Rodriguez, l Pacas, M "Control of a Single-Phase Cascaded H-Bridge Multilevel Inverter for GridConnected.
[13] L. M. Tolbert, F. Z. Peng, T. G. Habetler, "Multilevel converters for large electric drives," *IEEE Transactions on Industry Applications*, vol.35, no. 1, Jan. /Feb. 1999, pp. 36-44.