CHAPTER 5

CONCLUSION

5.1 GENERAL

This thesis has analyzed the performance of the CAC boost converter under open loop and closed loop conditions. The converter has been tested for both resistive load and motor load conditions. The hardware model of open loop CAC boost converter was developed. The simulation results proved that the closed loop CAC boost converter had better results compared to open loop CAC boost converter. The voltage regulation for the closed loop CAC converter consumes meager time as the output voltage is regulated as the circuit begins to operate. The voltage regulation for the CAC converter operating under motor load for closed loop condition consumes a time of 0.02 sec.

This thesis has also analyzed the performance of the TIB converter under open loop and closed loop conditions. The converter has been tested for both resistive load and motor load conditions. The hardware model of open loop TIB converter was developed. The simulation results proved that the closed loop TIB boost converter had better results compared to open loop TIB converter. The closed loop TIB converter operating under resistive load consumes time of 0.02 sec for the voltage to get regulated. The closed loop TIB converter operating under motor load consumes time of 0.7 sec for the voltage to get regulated. The performance of CAC boost converter and two inductor boost converter is compared.
The performance of AC chopper was optimized through the application of evolutionary algorithms evolutionary algorithm technique namely DE. The performance optimization is achieved with the elimination of lower order harmonics. The results obtained using DE reiterates extenuation of voltage harmonics for AC chopper through quicker convergence rate and lesser computational burden because of lesser computational parameters. The optimization task is for AC chopper but it can also be applied to the rest of the power converters. The DE algorithm has better performed by converging within 100 generations compared to GA algorithm which converges only above 500 generations.

The hardware model was developed for closed loop model of AC chopper. The switching signals were generated through TMS320C processor. The waveforms associated with the hardware were measured through MSO. The performance of AC chopper in its closed loop mode of operation has improved compare to its operation in the open loop mode. The THD in open loop operation is 102.9% and the THD has been reduced to 3.72% in closed loop operation.

5.2 SCOPE FOR FUTURE WORK

The future work would be the development of hardware models of CAC boost converter, two inductor boost converter for closed loop condition with various types of controller based upon the evolutionary algorithm techniques and various other performance improvement schemes such as sliding mode controllers.

The PWM AC chopper can also be developed based upon the algorithms such as Ant Colony Optimisation, Particle Swarm Optimisation and its hardware models could also be developed.