CHAPTER 7

CONCLUSION AND FUTURE SCOPE

7.1 CONCLUSION

In this thesis, an investigation is made on the blind channel estimation in OFDM system. The MB OFDM system model has been considered and the various blocks involved in the system are simulated. The performance analysis of MB OFDM system with AWGN channel is portrayed. The various channel parameters like mean excess delay, RMS delay spread, Number of paths carrying 85% of energy and number of paths over 10 dB peak are obtained for MB OFDM channel model and they are compared with UWB channel model.

The performance of MB OFDM is analysed by considering LS and MMSE based channel estimation algorithms. It is observed that MMSE based channel estimation algorithm performs better than LS estimate but the complexity of this method is high. RLS based channel estimation algorithm is proposed for estimating MB OFDM channel model parameters in which the blind RLS algorithm is used to get noise subspaces vector from autocorrelation matrix of the received signal vector. In order to get better estimate, Kalman algorithm is proposed for estimating MB OFDM channel parameters and Kalman filter state equations are derived accordingly. Kalman Filter algorithm has been developed for MB OFDM to estimate the channel models and it’s performance has been analysed over UWB channel models. It
is concluded that, the performance of Kalman filter based channel estimation gives better channel estimation as compared RLS based estimation because the knowledge of priori and posteriori channel is estimated for the cost of increase in computational complexity.

The channel estimation for the Multiband OFDM system is carried out extensively in the lower band. The Multiband OFDM systems in the higher bands give the different channel conditions to its counterpart. The channel estimation for these higher bands of the MB OFDM systems will be an interesting and extensive future research work. Hence the channel estimation process is a time consuming. This problem can be overcome by implementing the parallelism in the proposed algorithm.

The performance of the MB OFDM system for different PSK techniques has been analyzed. EPA, EA and ETU channel model performance has been evaluated for MB OFDM systems and also BER performance for different pilot density patterns has been analyzed.

### 7.2 FUTURE SCOPE

Frequency offset and time offset due to the mobility of the receiver are the major performance limiting factors in wireless communication systems. This work can be extended by incorporating the frequency and time offset estimation algorithm in addition to the channel estimation algorithms. Non-linearity in Kalman filter is the performance limiting factor in channel estimation. This problem is solved by considering the Extended Kalman filter (EKF) for the channel estimation. LTE is the standard which is proposed in 4G for high data rate application. This work can be extended by considering the above standard and performance can be analysed.