CHAPTER 6

SUMMARY AND CONCLUSION

6.1 RESULT ANALYSIS FOR 1/2 CODER

The Developed (NEW ) system was designed for 32 users. The OFDMA/ MC-CDMA transmission system was opted for the developed system. The digital modulation techniques like m-aryPSK, m-aryQAM, m-aryCPM and m-aryMHPM were inhibited for the developed system. The Turbo coder designed for symbol rate of 640ksymbols/s and 1/2 rate was incorporated in the system. The simulation was performed for the newly developed system using Matlab and Simulink Software.

The BER for digital modulation techniques like m-aryPSK (BER was from $10^{-5}$ to $10^{-4}$), m-aryQAM (BER was from $10^{-5}$ to $10^{-3}$), m-aryCPM (BER was from $10^{-5}$ to $10^{-2}$) and m-aryMHPM (BER was from $10^{-4}$ to $10^{-5.5}$). Since the m-ary MHPM has the very low range BER, m-ary MHPM was considered as the best modulation technique for 1/2 rate coder.

6.2 RESULT ANALYSIS FOR 1/3 CODER (SNR Vs BER)

The Developed (NEW ) system was designed for 32 users. The OFDMA/ MC-CDMA transmission system was opted for the developed system. The digital modulation techniques like m-aryPSK, m-aryQAM, m-aryCPM and m-aryMHPM were inhibited for the developed system. The Turbo coder designed for symbol rate of 640ksymbols/s and 1/2
rate was incorporated in the system. The simulation was performed for the newly developed system using Matlab and Simulink Software.

The simulation was performed using Matlab and Simulink software and the simulation results for OFDMA and MC-CDMA system were plotted for m-aryPSK, m-aryQAM, m-aryCPM and m-aryMHPM with the symbol rate of 640 kilo symbols/s.

The simulation was carried out for various users of up to 32 and the graphs were plotted between SNR Vs BER for digital modulation techniques like m-aryPSK, m-aryQAM, m-aryCPM and m-aryMHPM for both OFDMA and MC-CDMA system and the graphs were plotted. From the graphical analysis it is clear that the m-ary PSK, m-ary QAM, m-ary CPM and m-ary MHPM varies its array accordingly as the user rate increases from 1 user to 32 users.

6.3 RESULT ANALYSIS FOR 1/3 CODER (User Vs BER)

The Developed (NEW ) system was designed for 32 users. The OFDMA/ MC-CDMA transmission system was opted for the developed system. The digital modulation techniques like m-aryPSK, m-aryQAM, m-aryCPM and m-aryMHPM were inhibited for the developed system. The Turbo coder designed for symbol rate of 640ksymbols/s and 1/3 rate was incorporated in the system. The simulation was performed for the newly developed system using Matlab and Simulink Software.

The No. of users Vs BER curves were plotted for m-ary PSK, m-ary QAM, and m-aryCPM and m-aryMHPM modulation techniques of OFDMA system and MC-CDMA system. The No of users Vs BER curves were plotted for m-ary PSK (from $10^{-6}$ to $10^{-6.5}$), m-ary QAM (from $10^{-6}$ to
10^{-6.8}, m-ary CPM (from 10^{-6} to 10^{-6.9}) and m-ary MHPM (from 10^{-6.3} to 10^{-6.9}) modulation techniques of OFDMA system.

From the graphical analysis, it was clear that the m-ary CPM and m-ary MHPM modulation techniques m-ary CPM (from 10^{-6} to 10^{-6.9}) and m-ary MHPM (from 10^{-6.3} to 10^{-6.9}) have provided better result of BER and a minimum of up to 10^{-8} as compared to m-ary PSK and m-ary QAM m-ary PSK (from 10^{-6} to 10^{-6.8}), m-ary QAM (from 10^{-6} to 10^{-6.8}) which provide a BER of only up to 10^{-5}. Hence m-ary MHPM was considered as the best Adaptive modulation system followed by m-ary CPM, m-ary QAM and m-ary PSK for OFDMA system.

The No. of users Vs BER curves were plotted for m-aryPSK (from 10^{-5.8} to 10^{-6.5}), m-aryQAM (from 10^{-5.8} to 10^{-6.6}), m-aryCPM (from 10^{-6.3} to 10^{-6.5}) and m-aryMHPM (from 10^{-6.3} to 10^{-7.0}) modulation techniques of MC-CDMA system.

From the graphical analysis, it was clear that the m-ary CPM and m-ary MHPM modulation techniques i.e. m-ary CPM (from 10^{-6.3} to 10^{-6.5}) and m-ary MHPM (from 10^{-6.3} to 10^{-7.0}) have provided minimum BER of up to 10^{-8} as compared to m-aryPSK (from 10^{-5.8} to 10^{-6.5}) and m-aryQAM from 10^{-5.8} to 10^{-6.6}) which provides a minimum BER of only up to 10^{-6.8}. Hence m-ary MHPM was considered as the best Adaptive modulation system followed by m-ary CPM, m-ary QAM and m-ary PSK for MC-CDMA system.

Since the m-ary MHPM records the very low BER as compared to other m-ary modulation techniques, m-ary MHPM was considered as the best Adaptive modulation technique for both OFDMA system and MC-CDMA system.
6.4 FINAL SUMMARY

From the graphs it was found that for OFDMA System, the modulation techniques ranks in following hierarchy of m-ary MHPM, m-ary CPM, m-ary QAM and m-ary PSK where as for MC-CDMA system, the modulation techniques ranks as m-ary MHPM, m-ary CPM, m-ary PSK and m-ary QAM. Since the BER Range of m-ary MHPM is small compared to m-ary CPM, m-ary QAM and m-ary PSK, the m-ary MHPM is concluded as the best adaptive modulation technique for MC-CDMA and OFDMA System.

6.5 CONCLUSION

Based on the prediction of the expected channel conditions for next time slot, the modulation scheme was selected by the transmitter. The receiver was to be intimated properly about the set of de modulator parameters to be decided by it for proper receiving of the signal i.e. through proper signaling.

It was concluded that ACM efficiency could be increased in future if the RSC was increased with the decrease of symbol rate and hence the system switches to next array to mitigate the fall of symbol, thus the rate of symbols increases and vice versa.

The other deciding authority was the detoriation of channel. If the channel detoriation increases, the decay factor increases and ultimately the symbol decreases and so the modulation switches to next array automatically to maintain the lowest BER.

So it was decided that the ACM was an ultimate alternate for data detoriation and implementation of ACM technique will enhance the Wireless data communication.