

LIST OF FIGURES

1.1 Future challenges of 5G usecases.	2
2.1 A bipartite graph of Raptor codes.	7
2.2 A bipartite graph of LDGM codes.	7
2.3 An illustration of decoding process of LT codes.	9
2.4 Structure of accumulator.	10
2.5 An example of EXIT chart using $\Lambda(x) = \frac{1}{5}x^6 + \frac{4}{5}x^7$, and $\Omega(x) = \frac{1}{5}x^7 + \frac{4}{5}x^5$. . .	11
3.1 A model of wireless massive network.	13
3.2 Structure of transmitter and receiver between device and BS.	13
3.3 Structure of proposed LDGM-Raptor codes.	16
3.4 Flowchart of soft decoding algorithm.	20
3.5 Structure of Tornado decoder for EXIT functions.	23
3.6 Structure of accumulator with puncturing pattern $P = (1 : 2)$	24
4.1 EXIT Chart of the proposed Regular LDGM-Raptor codes at SNR of -0.3 dB.	28
4.2 (a). EXIT Chart of the proposed Irregular LDGM-Raptor codes at SNR of -1.5 dB. (b).EXIT chart projection of the proposed LDGM-Raptor codes.	29
4.3 EXIT chart of the proposed Tornado codes.	31
4.4 BER of Regular LDGM-Raptor codes in AWGN channel with block length of 1000 bits.	32
4.5 BER of Regular LDGM-Raptor codes in frequency-flat Rayleigh fading channels with block length of 1000 bits.	33
4.6 BER of Irregular LDGM-Raptor codes in AWGN channel with block length of 1080 bits.	34
4.7 BER of Irregular LDGM-Raptor codes in frequency-flat Rayleigh fading channels with block length of 1080 bits.	35
4.8 BER of Irregular Tornado codes in AWGN channel.	37
4.9 BER of Irregular Tornado codes in frequency-flat Rayleigh fading channels.	38
4.10 Performances comparison between LDGM codes, LDGM-Raptor codes, and Tornado codes.	40
4.11 Comparison of outage probability theory and simulation results for Regular LDGM-Raptor codes.	41
4.12 Comparison of outage probability theory and simulation results for Irregular LDGM-Raptor codes.	42

4.13 Comparison of outage probability theory and simulation results for Irregular Tornado codes.	43
--	----