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link budget; 3.6. Cell breathing in UMTS networks; 3.7. Intersite distance calculation in UMTS networks for different frequency reuse patterns; 3.8. Case study in UMTS networks; Chapter 4. OFDM and LTE; 4.1. Useful throughput of an OFDM waveform; 4.2. OFDM and PAPR; 4.3. Frequency selectivity and OFDM dimensioning; 4.4. OFDM dimensioning; 4.5. OFDM dimensioning for 4G networks and data rate evaluations; 4.6. LTE data rates evaluation; 4.7. LTE link budget; 4.8. LTE link budget taking into account the number of users; 4.9. Modulation-coding scheme relation, spectral efficiency and SINR in LTE networks; Chapter 5. MIMO and Beamforming; 5.1. Beamforming and signal-to-noise ratio; 5.2. Space diversity and chi-square distribution; 5.3. MIMO and capacity; Chapter 6. UWB; 6.1. Impulse UWB; 6.2. UWB and OFDM; 6.3. Link budget for UWB transmission; Chapter 7. Synchronization; 7.1. Cramer-Rao bound; 7.2. Modified Cramer-Rao bound; 7.3. Constant parameter estimation; 7.4. Radio burst synchronization; 7.5. Phase estimation for QPSK modulation; Chapter 8. Digital Communications Fundamentals; 8.1. Review of signal processing for signal-to-noise ratio; 8.2. Review of digital modulations; 8.3. Review of equalization; 8.4. Signal-to-noise ratio estimation; 8.5. ASK 2 modulation error probability; 8.6. Spectral occupancy, symbol rate and binary throughput; 8.7. Comparison of two linear digital modulations; 8.8. Comparison of two-PSK modulation and power evaluations; 8.9. Zero-forcing linear equalization; 8.10. Minimum mean square error linear equalization

Sommario/riassunto

Wireless telecommunication systems generate a huge amount of interest. In the last two decades, these systems have experienced at least three major technological leaps, and it has become impossible to imagine how society was organized without them. In this book, we propose a macroscopic approach on wireless systems, and aim at answering key questions about power, data rates, multiple access, cellular engineering and access networks architectures. We present a series of solved problems, whose objective is to establish the main elements of a global link budget in several radiocommunicati
