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	Nota di contenuto	Cover; Contents; Contributors; Foreword; Acknowledgments; Acronyms; 1 Small cell networks overview; 1.1 Overview of small cell networks; 1.2 Technical and deployment challenges in small cell networks; 1.2.1 Self-organization; 1.2.2 Backhauling; 1.2.3 Handover; 1.2.4 Interference; 1.3 Overview of contributions in the book; References; 2 Fundamentals of access control in femtocells; 2.1 Access control in femtocell deployments; 2.2 System model; 2.2.1 Channel model and interference characterization; 2.2.2 Femtocell coverage and cell association; 2.2.3 Resource allocation 2.3 Femtocell access control in the downlink2.3.1 Additional models for downlink analysis; 2.3.2 Coverage geographic zones; 2.3.3 Per-zone average SIR and throughput; 2.3.4 Per-tier throughput; 2.3.5

Conclusion for the downlink analysis; 2.4 Femtocell access control in the uplink; 2.4.1 Simplifications of the general system model; 2.4.2 Additional models for uplink analysis; 2.4.3 Throughput in orthogonal multiple access; 2.4.4 Throughput in non-orthogonal multiple access; 2.5 Summary and conclusions; References; 3 Coverage analysis using the Poisson point process model; 3.1 Introduction
3.2 Distribution of SINR3.2.1 Determining the CDF of SINR via simulation; 3.2.2 The role of analytic modeling; 3.3 The Poisson point process model for BS locations; 3.4 Wireless channel model; 3.4.1 Path-loss model; 3.4.2 Fading model; 3.5 Statement of the SINR calculation problem; 3.5.1 Candidate serving BSs and the serving BS; 3.5.2 Definition of SINR; 3.5.3 Marginal and joint complementary CDF (CCDF) of SINR; 3.5.4 Canonical form of joint CCDF; 3.5.5 Specifying the location of the UE; 3.6 Effectiveness of the PPP model for analysis; 3.6.1 A basic result
3.6.2 Key advantage of the PPP model: calculating LZ(s)3.6.3 Determining when a Z-matrix is an M-matrix; 3.7 Expressions for joint and marginal CCDF of SINR; 3.7.1 Joint CCDF: candidate serving BS is ``nearest''; 3.7.2 Joint CCDF: candidate serving BS is ``strongest''; 3.7.3 Implications for system design; 3.7.4 Marginal CCDF for different selection criteria for the serving BS; 3.8 Application: camping probability in a macro-femto network; 3.8.1 BS location model; 3.8.2 Path-loss model; 3.8.3 UE camping and outage criteria; 3.8.4 Probability that a UE can camp on a macro BS
3.8.5 Probability that a UE can camp on an OA femto BS3.8.6 Probability that a UE can camp on a macro BS or an OA femto BS; 3.8.7 Numerical results and discussion; 3.9 Comparison between results for ``regular'' and PPP layouts; 3.9.1 Comparison of SIR distributions for PPP and regular BS layouts; 3.9.2 Comparison of achievable rates to UEs for the PPP and regular BS location models; 3.10 Conclusions; References; 4 Interference modeling for cognitive femtocells; 4.1 Introduction; 4.2 Stochastic geometry; 4.3 System model; 4.3.1 Activity protocols of the femtocell network users
4.3.2 Interference model

Sommario/riassunto

This comprehensive resource explores state-of-the-art advances in the successful deployment and operation of small cell networks. A broad range of technical challenges, and possible solutions, are addressed, including practical deployment considerations and interference management techniques, all set within the context of the most recent cutting-edge advances. Key aspects covered include 3GPP standardisation, applications of stochastic geometry, PHY techniques, MIMO techniques, handover and radio resource management, including techniques designed to make the best possible use of the available spectrum. Detailed technical information is provided throughout, with a consistent emphasis on real-world applications. Bringing together world-renowned experts from industry and academia, this is an indispensable volume for researchers, engineers and systems designers in the wireless communication industry.