

Preface

Multi-hop relay is considered as one of the main keys for Long Term Evaluation—Advanced (LTE-A) to meet the growing demand for coverage extension and capacity enhancement. However, these benefits of multi-hop depend on the location of Relay Node (RN) which mitigates interference among the cells.

This book consists of five chapters and is organized as follows:

Chapter 1 gives an overview, clarifying the issues and motivating aspect of the research, together with the objectives, and overall book layout.

Chapter 2 provides a literature survey for various methods of relay deployment, and updates the state of current developments and solutions in the field of relay techniques, while evaluating the developments and solutions and critique of each method.

Chapter 3 gives a detailed explanation of three mathematical modeling techniques called Optimum RN Deployment (ORND), Enhance Relay Link Capacity (ERLC), and Balance Power Algorithm (BPA) within LTE-A cellular networks. ORND involves the mathematical derivation of the optimum RN location, an allocation of transmitted power for each RN, the optimum number of RNs within cell, the handover process, and the frequency reuse scheme. ERLC focuses on performance analysis by employing two antenna types in the RN to enhance relay link capacity. At the end of this chapter, the BPA is illustrated to minimize the transmission power consumption for MR.

Chapter 4 details the results from mathematical formulations and compares it with the simulation results in terms of spectral efficiency, coverage area, throughput, and transmission power consumptions for the MR using BPA.

Chapter 5 presents optimum location for relay node in LTE-A. This chapter concludes the originality and innovations with a summary of the results.

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