Reduction of Inter-Cell Interference (ICI) by Fractional Frequency Reuse (FFR) in Orthogonal Frequency Division Multiple Access (OFDMA)

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ABSTRACT

Interference coordination technique using Fractional Frequency Reuse (FFR) is compatible to Orthogonal Frequency Division Multiple Access (OFDMA) based wireless networks which expected to be orthogonal to each other, as well inter-cell interference (ICI) is the main source of interference that restrictive for users near the boundary cells. This work focus on reduction of interference in inter-cell at the same time reduces the Power in (Watt), Capacity and Base Station Power in (Watt) thus improves the performance of system. The implementation system models of Fractional Frequency Reuse (FFR), clarifies that interference problem in inter-cell can be resolve through MATLAB simulation via formulating the optimization problem. At the end of stage, simulation results demonstrate that the proposed scheme FFR outperforms conventional Reuse-1 and Reuse-1/2 schemes by develop 12.98% in terms of Bit Error Rate (BER) and Signal to Interference Ratio (SINR).

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Interference has been demonstrated as the most important problem of wireless communication systems throughout many years. ICI (Inter-cell Interference) is schemes in order to expand the performance of the network where each cell allocates its resources at the same time minimize the interference in the system, simultaneously increasing the spatial reuse. ICI technique in OFDMA based wireless networks presented FFR (Fractional Frequency Reuse) as mentioned in [1]. The main idea of FFR is to shares the cells bandwidth in objectives to improves cell-edge users of adjacent cells by decrease interferences; in and out of cell-interior users and more efficiently expending available spectrum compare to conventional frequency reuse by referring to [2].

ICI limited to downlink throughput performance in cellular systems hence to reduce interference using Co-Channel Interference (CCI) mitigation schemes, specifically for users at the cell edge, it is require to compromise throughput system due to the resource partitioning. Hence, FFR has been proposed to balance the cell-edge throughput and overall throughput of system. The reuse partitioning system is combination of low and high Frequency Reuse Factors (FRF) by sharing the cell in two zones, center and edge as in [3].