

Interference Management in Long Term Evolution-Advanced System

Authors : Selma Sbit, Mohamed Bechir Dadi, Belgacem Chibani Rhaimi

Abstract : Incorporating Home eNodeB (HeNB) in cellular networks, e.g. Long Term Evolution Advanced (LTE-A), is beneficial for extending coverage and enhancing capacity at low price especially within the non-line-of sight (NLOS) environments such as homes. HeNB or femtocell is a small low powered base station which provides radio coverage to the mobile users in an indoor environment. This deployment results in a heterogeneous network where the available spectrum becomes shared between two layers. Therefore, a problem of Inter Cell Interference (ICI) appears. This issue is the main challenge in LTE-A. To deal with this challenge, various techniques based on frequency, time and power control are proposed. This paper deals with the impact of carrier aggregation and higher order MIMO (Multiple Input Multiple Output) schemes on the LTE-Advanced performance. Simulation results show the advantages of these schemes on the system capacity (4.10×10^9 b/s/Hz when bandwidth $B=100$ MHz and when applying MIMO 8x8 for SINR=30 dB), maximum theoretical peak data rate (more than 4 Gbps for $B=100$ MHz and when MIMO 8x8 is used) and spectral efficiency (15 b/s/Hz and 30b/s/Hz when MIMO 4x4 and MIMO 8x8 are applying respectively for SINR=30 dB).

Keywords : capacity, carrier aggregation, LTE-Advanced, MIMO (Multiple Input Multiple Output), peak data rate, spectral efficiency

Conference Title : ICCITE 2017 : International Conference on Communication and Information Technology and Engineering

Conference Location : Istanbul, Türkiye

Conference Dates : September 28-29, 2017