Abstract

Demand for high speed, innovative and up-to-date technologies is always on the rise. In terms of capacity, cellular networks are near to their physical limit. But the expansion of data services still increasing exponentially. The shift from legacy computers to smartphones made things even more complex by introducing hungry applications demanding high data rates such as Web browsing, email, video sharing, social networking, online interactive games, and location-based services, etc. All such services and obviously future services are bandwidth hungry and can’t be bounded to certain areas only. To provide such services for outdoor users is not a significant issue but it becomes a challenging task for service providers to offer such services for indoor users. The strength of the signal is deteriorated quite significantly due to penetration-losses from different physical barriers including walls and floors. In order to meet the demand of providing good quality signal strength indoor, one of the most promising solutions provided by the 3rd Generation Partnership Project (3GPP) for improving capacity, speed and signal strength is the deployment of femtocell for future wireless networks. Femtocell has a small cell based architecture. It is a plug and play, fully featured, low-powered cellular base station
residing indoors where usually a poor signals are received from outdoor base stations. However, their deployment brings many challenges. Interference management is one of them in case of their uncoordinated deployment in the coverage range of macro base stations. A femtocell based method with controlled power is designed and implemented to mitigate cross-tier downlink interference between the macro base station and femtocell users. In this paper, the feasible transmission power of femtocell is determined with respect to user locations in different scenarios and to achieve targeted signal-to-interference-plus-noise-ratio (SINR) values. Performance analysis in various scenarios of the proposed method is presented. The results of proposed scheme can improve system performance in terms of received signal strength.

References


Index Terms

Computer Science Information Sciences
Keywords

3GPP, SINR, Downlink, Data rate.