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Cross-Tier Interference Avoidance Technique for LTE-A Femtocell Networks Using Fractional Frequency Reuse (Conference Paper)

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Abstract

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Deploying femtocell overlays over LTE-A macrocellular networks is an effective way to overcome the scarcity of bandwidth, increase the network coverage, enhance the indoor users' performance, and improve the quality of service. Nevertheless, it will bring the cross-tier interference issue to prominence leading to dramatic degradation of these networks' performance if no strategy is taken to tackle this problem. Using the Fractional Frequency Reuse (FFR) concept can be one of the good solutions to manage this interference. This paper proposes an FFR scheme for LTE-A femtocell networks to handle the downlink cross-tier interference, generated between macro-cells and femtocells, in order to increase the Signal-to-Interference and Noise Ratio (SINR) and improve the overall network performance. The simulation results obtained by MATLAB reveal the superiority of the proposed-FFR scheme over the non-FFR one; as both SINR and user throughput have been enhanced. Outage probability results also prove that the proposed scheme can effectively support more users. © 2020 IEEE.

SciVal Topic Prominence ⓘ

Topic: Femtocell | Heterogeneous Networks | Frequency Reuse

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Author keywords

cross-tier interference femtocell FFR LTE-A

Indexed keywords

Engineering controlled terms: Femtocell MATLAB Mobile ad hoc networks Quality of service Signal interference Signal to noise ratio

Engineering uncontrolled terms: Cross-tier interferences Femtocell Networks Fractional Frequency Reuse Fractional frequency reuses (FFR) Macrocellular Network coverage Outage probability Signal-to-interference and noise ratios

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