Correlation Phenomenon versus Beam-subset Scenario in MIMO-femtocell System with Fading Environments (on_line)

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ABSTRACT

The channel correlation happens in a MIMO-femtocell (multiple-input multiple-output) system with beam-subset beamforming technique is investigated in this paper. MIMO-femtocell system constructed with MIMO signaling that is adapted to a tiered femtocellular network. The MIMO-femtocell system deployed with home base station (BS) in a single floor indoor environment is proposed. According to the analyses of both theoretical and simulation results, channel correlation definitely degrades the overall system performance of a MIMO-femtocell system with beam-subset, especially in indoor channels. Moreover, the coverage area of a MIMO-femtocell deployment is reduced because of channel correlation occurring in the propagation channel. Some analyzed of closed forms are utilized to discuss the phenomenon of channel correlation that exists in MIMO-femtocell systems. Specifically, many numerical results, which are applied to validate the performance of being derived throughput, and the curves match well with the simulation results obtained from the software package. It is noteworthy to remember that if the channel correlation phenomenon is neglected in the performance evaluation of a MIMO-femtocell system over the Rayleigh statistical model, there will be one to about four folds degradation existing in the BS coverage area. Moreover, the number of beamsubset is the other parameter dominates the system performance of a MIMO-femtocell system when the beamforming signaling is applied in the operation.

Keywords: Beam-subset Channel correlation Coverage area MIMO-femtocell
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