Abstract

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Outage probability and percentage of cell area of OFDMA cellular systems with sectoring

Orthogonal frequency division multiplexing (OFDM) is an important candidate for fourth generation cellular systems that support high data rates. Performance of OFDM systems is sensitive to non-perfect frequency synchronization, which leads to frequency offsets and a consequent degradation in system performance. In cellular systems, there is a tradeoff between link quality and capacity; both are controlled by cell cluster size. Smaller cluster sizes gain higher capacity, yet they cause an increase in co- channel interference, which degrades the system outage probability performance. Moreover, a key technique for reducing co-channel interference is sectoring, where a single OMNI directional antenna is replaced by multiple directional antennas. In this paper, the performance of OFDMA cellular systems with sectoring is investigated aided with extensive simulations. System performance is evaluated through the investigation of system outage probability and percentage of cell area for various system configurations namely, various cluster sizes, sectoring factors and frequency offsets.