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Enhanced Cell-Edge Performance With Transmit Power-Shaping

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Abstract: Literature reported a technique called "fuzzy cells" that builds on the multicarrier features of Long-term Evolution-Advanced (LTE-A) and high speed packet access (HSPA). Multiple carriers are aggregated to create a larger system bandwidth, and these carriers are transmitted at different powers by each sector antenna. This creates a set of cell-edge locations that differ from one frequency to the next. System-level simulations are performed to estimate individual user and average throughput for a hexagonal deployment of 3-sector base stations. For moderately high loads, a fuzzy cell deployment can improve tenth percentile (cell-edge) user throughput by 100% and can improve average throughput by about 30% compared with a reuse 1 scheme. Fuzzy cells reduce inter-cell interference in the same way as the higher-order reuse schemes and allow the user to access the full system bandwidth.