Impact of Multi-beam Antenna Amplitude Tapering on Co-Channel Interference and Backhaul Throughput Density

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Abstract:

Multi-beam antennas, combined with aggressive frequency reuse have recently been considered to increase the throughput density in densely deployed cellular networks. However, the latter is limited by Co-Channel Interference (CCI). To mitigate this problem, amplitude tapering in multi-beam antenna scenarios is investigated in this paper. Results show that tapered beams significantly improve the Carrier to Interference Ratio (CIR) from 5 to 8 dB and consequently achieve downlink backhaul throughput density over 0.6 Gbps/km2. An overall throughput density of 1.2 Gbps/km2 is expected when taking both up- and downlinks in to account.