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Pattern Synthesis with Uniform Circular Arrays for the Reduction of WCDMA Intercell Interference

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Abstract: The deployment of advanced antenna arrays at the base stations of cellular systems is a key technique in reducing intercell interference, and thus increasing the number of served users. Uniform circular arrays (UCAs) provide 360 degrees of coverage, their patterns are steering-invariant and their sidelobe levels are controllable. This paper investigates the use of UCAs having specially synthesized patterns at the base stations of WCDMA cellular systems. The decrease in the ratio of intercell interference to intracell power resulting from the use of these arrays in a beam-steering scheme will be assessed, and the advantages and disadvantages of each pattern type will be discussed. The paper also looks into the interference reduction obtained by stacking several UCAs to form a cylindrical array.

Key Words: Antenna arrays, WCDMA, intercell interference

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