Abstract

Concentric circular arrays are increasingly shown more interest in antenna design for generating low sidelobe patterns as they have radial symmetry and an invariant beam in the azimuthal plane. Such patterns are desirable in low EMI applications. In the present work, an attempt is made to generate low sidelobe patterns from concentric circular arrays by optimizing both ring radii and individual element excitations. The array is also subjected to thinning simultaneously. Thinning results in sidelobe reduction while keeping the number of active elements small. For each optimum configuration, the optimal ring radii and the amplitude excitation levels are obtained using Differential Evolution algorithm. Results are presented for 8, 10 concentric rings.

References

- C. A. Ballanis, 1997. Antenna theory analysis and design, 2nd edition, John Willey and
Generation of Narrow Beams using Differential Evolution Algorithm from Circular Arrays

Son's Inc., New York.
Index Terms

Computer Science Networks

Keywords

Concentric Circular Array Antenna  Array Thinning  Optimization  Sidelobe Reduction  Differential Evolution.