Abstract

In this paper the maximum sidelobe level (SLL) reductions without and with central element feeding in various designs of three-ring concentric circular antenna arrays (CCAA) are examined using Particle Swarm Optimization with Constriction Factor Approach (PSOCFA) to finally determine the global optimal CCAA design. Binary coded Genetic Algorithm (BGA) is also employed for comparative optimization but it proves to be suboptimal. The present paper assumes non-uniform excitations and uniform spacing of excitation elements in each three-ring CCAA design. Among the various CCAA designs, the three-ring CCAA containing central element and 4, 6 and 8 elements in three successive concentric rings proves to be such global optimal design with global minimum SLL (-17.42dB) determined by PSOCFA.

Reference


**Index Terms**

Electronics  
Performance and Reliability

**Key words**

Concentric Circular Antenna Array  
Non-uniform Excitation  
Sidelobe Level  
Binary Coded Genetic Algorithm  
Particle swarm optimization with constriction factor approach