Uniform Circular Arrays for Phased Array Antenna

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Abstract—**This paper compares the performances of a number of uniform circular array (UCA) configurations for phased array antennas. A UCA geometry is targeted due to its symmetrical configuration which enables the phased array antenna to scan azimuthally with minimal changes in its beam width and sidelobe levels. Each UCA configuration consists of 19 isotropic elements. Particle Swarm Optimization (PSO) is used to calculate the complex weights of the antenna array elements in order to adapt the antenna to the changing environments. Comparisons are made in the context of adaptive beamforming properties and Signal to Interference Ratio (SIR). The results obtained suggest that a planar uniform hexagonal array PUHA (1:6:12) is suitable for high resolution applications as its sidelobe levels are the lowest compared to the other geometries.**