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Minimum Half Power Beam Width and Side Lobe Level Reduction of Linear Antenna Array Using Particle Swarm Optimization

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Abstract : In this paper the optimization performance of non-uniform linear antenna array is presented. The Particle Swarm Optimization (PSO) algorithm is presented to minimize Side Lobe Level (SLL) and Half Power Beamwidth (HPBW). The purpose of using the PSO algorithm is to get the optimum values for inter-element spacing and excitation amplitude of linear antenna array that provides a radiation pattern with minimum SLL and HPBW. Various design examples are considered and the obtain results using PSO are confirmed by comparing with results achieved using other nature inspired metaheuristic algorithms such as real coded genetic algorithm (RGA) and biogeography (BBO) algorithm. The comparative results show that optimization of linear antenna array using the PSO provides considerable enhancement in the SLL and HPBW.

Keywords : linear antenna array, minimum side lobe level, narrow half power beamwidth, particle swarm optimization
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