ICIC Express Letters, Part B: Applications, 1(2): 113-118

Multiple interference cancellations of linear adaptive array antenna using Amplitude-Phase Perturbations based on particle swarm optimization

Hsu, Chao-Hsing; Chen, Chun-Hsiang; Kuo, Kun-Huang; Shyr,Wen-Jye; Chung, Yi-Nung; Lin, Tsung-Chih

Abstract

In this paper, a novel optimization method based on the particle swarm optimization (PSO) algorithm is proposed for the multiple interference cancellation design of linear adaptive array antenna using Amplitude-Phase Perturbations. An adaptive array antenna can suppress the interferences in the interfering directions by using optimization techniques in its adaptive array factor (AF) so as to increase the Signal to Interference Ratio (SIR). The PSO is used to solve combinatorial optimization problems. The PSO is applied to find the weighting vector of AF, which makes the pattern nulling optimization of the proposed adaptive antenna. This technique can also implement the cancellation of multiple interferences for different incident directions in practical wireless communication systems. Simulation example demonstrates the excellent effectiveness of the proposed method.

Key words: Amplitudephase perturbations; Linear adaptive array antenna;
Multiple interference cancellations;
Particle swarm optimization