

Study and Design of a Four-Dimensional MIMO Antenna Array

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Abstract

In the recent years, TMAAs are studied by a new perspective in which part of the sideband radiation is considered as a useful radiation. In particular, the possibility to consider the switch-on instants added to the switch-on times as a new degree of freedom in the synthesis process allows to better control the harmonics radiated patterns, and hence to synthesize patterns at the central frequency and at the harmonic frequencies, as well. This project proposes an harmonic beam-forming synthesis technique based on particle swarm optimizer (PSO) algorithm: multiple patterns are generated at the central and harmonic frequencies, proposing a multi-frequencies beam patterns with a single antenna array in order to receive simultaneously multiple signal from different direction, and placing the nulls in the direction of arrival of the interfering signals to maximize the signal-to-noise-plus-interference-ratio (SINR).

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