Guidelines for Student Reports

Harmonic beamforming in time-modulated linear arrays through pulse splitting

M. Dallaglio

Abstract

In the recent years, TMAs have been studied by a new perspective in which part of the sideband radiation is exploited for useful purposes. 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 the particle swarm optimizer (PSO) algorithm: multiple patterns are generated at the central and harmonic frequencies. Moreover, pulse-splitting technique is adopted so that time modulation period is divided into several subsections (similarly with, but using arbitrary switch-on/off instants): thanks to the additional degrees of freedom, this new approach provides more flexibility in the design of the antenna array.

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This report is submitted in partial fulfillment of the degree of the course "ACM".
Supervisors: Prof. Andrea Massa, Dr. Lorenzo Poli.