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Interference Suppression of ULA Antennas by Phase-only Control Using BAT Algorithm

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Author(s)

Luyen Van Tong ; Vu Bang Giang Truong

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Abstract

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Abstract:

This paper proposes an adaptive BAT algorithm (BA) based beamformer for pattern nulling of half-wave Dipole Uniformly Spaced Linear Array (DULA), of which the imposed nulls have been placed at directions of interferences. This pattern nulling is obtained by controlling only the phase of each array element. In order to verify the proposal, several scenarios of DULA pattern with the pre-set nulls have been performed and compared with those of genetic algorithm (GA) and accelerated particle swarm optimization (APSO) considering mutual coupling. The proposed beamformer has shown the ability to suppress side lobes, to maintain predefined beamwidth, to place precisely single, multiple, and broad nulls at an arbitrary direction of interferences. Furthermore, the beamformer is much faster and more effective in terms of null steering and side lobe suppression in pattern synthesis than GA and APSO based ones.

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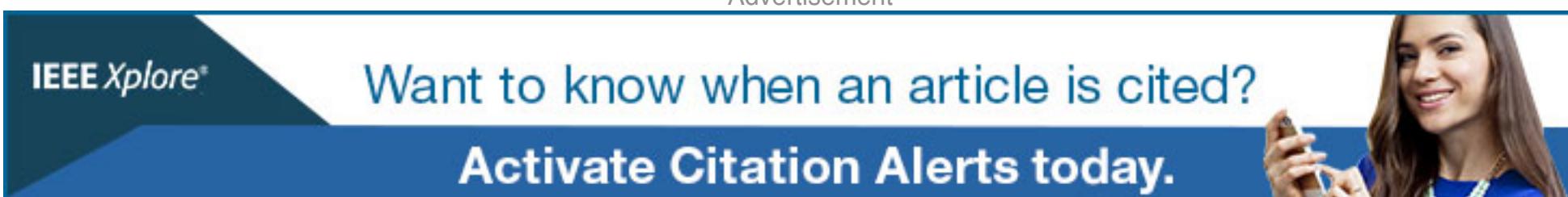
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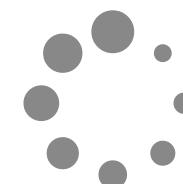
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