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Scalability Analysis for Designing Large-Scale Antenna Array Using Sub-Array

(Conference Paper)

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Abstract

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Large-scale antenna arrays have been studied for a variety of applications including 5G technology. Large number of antenna arrays provide high multiplexing gains and array gains with high directivity for better performance in terms of data rate or link reliability. This paper implements a simple and efficient technique of using sub-arrays for the development of large uniform arrays. Large arrays can be formed by repeating a small sub-arrays throughout the rest of the large array. The use of sub-arrays simplifies the large array design by allowing the designer to concentrate on the smaller sub-array before constructing larger arrays. Thus, the performance and radiation characteristics of large arrays can be predicted through the investigation of sub-arrays. The array-factor for a planar subarray of 2x2 (4 elements) is analysed using Mat-lab software and then a large arrays are formed by placing the 2x2 sub-array in three different configurations i.e., in a rectangular, square and linear arrangements up to 16x16 planar array. Thus, the arrayfactors, directivities, HPBW, and sidelobes of the constructed large arrays have been analysed and compared with the small sub-array. © 2018 IEEE.

Author keywords

[Large antenna array](#) [Sub-array and Scalability](#)

Indexed keywords

Engineering controlled terms: [5G mobile communication systems](#) [Directional patterns \(antenna\)](#) [Scalability](#)

Engineering uncontrolled terms: [Large antennas](#) [Large scale antennas](#) [Linear arrangements](#) [Link reliability](#) [Multiplexing gains](#) [Radiation characteristics](#) [Scalability analysis](#) [Sub-arrays](#)

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