

Abstract

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Effect of the Mutual Coupling on the Least Mean Square and Recursive Least Square Beamforming Algorithms Algorithm

Smart antenna became a challenge in wireless mobile communication not only for the capacity it offers but also for its good coverage. Smart antennas can also improve signal to noise ratio (SNR) and help in rejecting interference signal, that's why they are playing a main role in anti-jamming. Most of the beamforming algorithms used in adaptive antenna array consider a linear antenna array composed of isotropic point sources. In this paper, half wavelength dipole antenna elements are used instead of point sources to investigate the effect of mutual coupling between antenna elements on two well-known algorithms for beamforming used in smart antennas. These two algorithms are least mean square (LMS) and recursive least square (RLS) algorithms. The mutual coupling effect is examined on both algorithms; a comparison between both algorithms is carried out by simulation results using MATLAB and MCAD codes. To measure the performance of both algorithms many plots are shown including array factor patterns, resulting adapted weights magnitude, mean square error (MSE), signals (desired and array output).