Abstract

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Applying the LMS and RLS Beamforming Algorithms on Actual Linear and Planar Antenna Array

After revolution in wireless communication system, it is observed that the number of users and the requirements of wireless services increase at exponential rate. The wireless services need wider convergence area and higher transmission quality rises. The smart antenna system is used to achieve wireless services demands by using direction of arrival (DOA) and adaptive beamforming algorithms. Most of the famous adaptive antenna algorithms are applied using linear antenna array and the antenna elements are considered to be isotropic point sources. In this paper, the performance of the least mean square (LMS) and recursive least squares (RLS) algorithms using planar array are applied instead of using linear antenna array. Also, Finite size antenna elements are considered to study the effect of mutual coupling between antenna elements. Those algorithms are used to minimize the error, which occur due to high data rate and multiusers. The simulation results for two algorithms using both antenna arrays, linear and planar, in the absence and presence of mutual coupling are carried out to compare between LMS and RLS algorithms. The array factor, error squared, weights adaptation, desired and the array output plots are carried out. As expected, they show that the performance for both algorithms using planar array are better than using linear array.