

Abstract:

Wireless data traffic is in a continuous growth, and there are increasing demands for wireless systems that provide deep interference suppression and noise mitigation. In this paper, adaptive beamforming (ABF) technique for Smart Antenna System (SAS) based on Minimum Variance Distortion less Response (MVDR) algorithm connected to Circular Antenna Array (CAA) is discussed and analyzed. The MVDR performance is evaluated by varying various parameters; namely the number of antenna elements, space separation between the elements, the number of interference sources, noise power label, and a number of snapshots. LTE networks allocate a spectrum band of 2.6 GHz is used for evaluating the MVDR performance. The MVDR performance is evaluated with two important metrics; beam pattern and SINR. Simulation results demonstrate that as the antenna elements increase, the performance of the MVDR improves dramatically. This means the performance of MVDR greatly relies upon the number of the elements. Half of the wavelength is considered the best interelement spacing, the performance degraded as noise power increased, and more accurately resolution occurred when the number of snapshots increased. The proposed method was found to be performed better than some existing techniques. According to the result, the beam pattern relies on the number of element and the separation between array elements. Also, the SINR strongly depends on noise power label and the number of snapshots.