

# Abstract

**Mohamed Mahmoud Omar**

## **The Mutual Coupling Effect on the MUSIC Algorithm for Direction of Arrival Estimation**

Adaptive array smart antenna involves the array processing to manipulate the signals induced on various antenna elements in such way that the main beam directing towards the desired signal and forming the nulls towards the interferers. Such smart antennas are widely used in wireless mobile communications as they can increase the channel capacity and coverage range. In adaptive array smart antenna, to locate the desired signal, various direction of arrival (DOA) estimation algorithms are used. This paper investigates the effect of mutual coupling on the MUSIC algorithm for DOA estimation and compares its performance with Bartlett algorithm. The half-wavelength dipole antenna elements are used in the linear array antenna to carry out a performance study of the MUSIC and Bartlett algorithms by investigating the effect of the mutual coupling between the array elements. However simulation results in this paper show that MUSIC algorithm is highly accurate and stable and provides high angular resolution compared to Bartlett and hence MUSIC algorithm can be widely used in mobile communication to estimate the DOA of the arriving signals.