

## **Comparative Analysis of MUSIC Algorithm in Smart Antenna**

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**Abstract** – High-resolution signal parameter estimation is a major problem in many signal processing applications. Such applications contain direction of arrival (DOA) estimation for narrow band signals and wideband signal emitted by multiple sources and received by sensor arrays. It is well known that MUSIC algorithm outperforms any other method existing in the literature. This paper uses different MUSIC algorithms for DOA estimation viz; Simple MUSIC Algorithm, ROOT-MUSIC Algorithm, Spatially Smoothed MUSIC Algorithm and Toeplitz approximation based MUSIC algorithm. The matrix Toeplitz approximation recovers the Toeplitz structure, and the approximated matrix is used to obtain more accuracy estimates via MUSIC method.

**Keywords** – DOA, MUSIC, ROOT MUSIC, Toeplitz Matris.