DOA Estimation for Different Antenna Array Structures

1.Introduction

Smart antennas have gained great interest among researchers during recent years, and different antenna array structures have different characteristics, which are applied to different situations. At the same time, DOA(Direction of Arrival) is a very important parameter for smart antennas, and there are many algorithms to estimate it. In this paper, what I focus on is DOA estimation for different array structures based on MUSIC(Multiple Signal Classification) algorithm.

2.Statement

For simplify, let [1], [2]and [3] representative three papers which I refer to in my work, and the name of these papers will be listed in the end. Briefly, paper [1] introduces three different array structures, which are uniform linear arrays(ULA), uniform circular arrays(UCA), and uniform rectangular arrays(URA); Paper [2] applies MUSIC algorithm in the planar array antenna; Paper [3] analyzes the performance of MUSIC and ESPRIT DOA estimation for adaptive array smart antenna in mobile communication.

3.Expectation

In my paper, firstly, I plan to make an introduction to smart antenna. Secondly, I will derive array steering vectors and signals that antenna array receive for different array structures, for example, ULA, UCA, URA in my own word, and make them more generalized. Thirdly, I will introduce the importance of DOA estimation and MUSIC algorithm. Next, verifying MUSIC algorithm for different situations is necessary and compare them from different perspectives. At last, I will make a short summary.

4.References

[1]L. Jin, L. Li, and H. Wang, "Investigation of Different Types of Array Structures for Smart Antennas," IEEE International conference on Microwave and Millimeter Wave Technology, vol. 3, pp. 1160 - 1163, 2008

[2]C. Sun, “The application of MUSIC algorithm in the planar array antenna,”2015

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[3]T.B. LAVATE, V.K. KOKATE, A. M. SAPKAL, “Performance Analysis of MUSIC and ESPRIT DOA Estimation algorithms for adaptive array smart antenna in mobile communication," 2010 Second International Conference on Computer and Network Technology (ICCNT), pp. 308 - 311, 2010

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