论文

基于微小频偏的新的四阶累积量DOA子空间估计法

刘学斌, 季飞, 韦岗

华南理工大学电子与信息学院 广州 510640

摘要
在采用基于四阶累积量的子空间法进行DOA估计时, 一般要求基带信号独立, 以保证信号四阶不相干, 否则估计性能将下降。该文提出一种新的四阶累积量DOA估计法, 解除了对基带信号独立性的要求。该方法对每一个基带信号分配一个基带载波, 基带载波相对射频载波是一个微小偏差。该文推导了在基带信号独立和相关两种情况下, 信号四阶相干性与基带载波频率的关系:设计出了在基带信号相关情况下, 保证信号四阶不相干的微小频偏集。仿真结果验证了设计的正确性和有效性。

关键词　DOA估计　四阶累积量　微小频偏

分类号　TN911.7

A New Subspace Method of DOA Estimation with Four-Order Cumulants Based on Small Frequency Offset

Liu Xue-bin, Ji Fei, Wei Gang

Dept of Electron. & Info. Eng., South China Univ. of Tech., Guangzhou 510640 China

Abstract
To achieve good performance when applying subspace method based on four-order cumulants in DOA estimation, signals are required to be independent to satisfy non-coherence of four-order. Here, a modified method without independence requirement is proposed. First, the relation between non-coherence of four-order and carrier frequencies of analytical signal is studied with baseband signals independent or not, then a set of small frequencies offset is designed. With the transmitter modulating signals in baseband with the frequencies, the array receiver can achieve good performance of DOA estimation with subspace method based on four-order cumulants whether signals are independent or not. Simulation proves its validity.

Key words　DOA estimation　Four-order cumulants　Small frequency offset

DOI :

通讯作者

作者个人主页　　刘学斌; 季飞; 韦岗