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研究论文

用干涉式APES算法实现干涉阵盲DOA估计

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摘要：

针对干涉阵的波达方向估计，提出一种干涉式幅相估计的盲波达方向估计算法．利用干涉式幅相估计算法的空间谱和模型阶数选择准则获得目标个数和目标方向余弦的粗估计; 使用子阵间的相位中心偏移来获得目标方向余弦的精估计．针对干涉阵带来的测角模糊问题，采用双尺度解模糊算法得到高精度且无模糊的目标波达方向估计．该算法是一种盲波达方向估计方法，精度较多重信号分类算法和双尺度旋转不变子空间算法的高．计算机仿真结果和实测数据验证了干涉阵波达方向估计的高精度测角性能和有效性．

关键词： 干涉阵 盲波达方向估计 干涉式幅相估计 Bayesian信息准则 解模糊

Interferometric array blind DOA estimation using the interferometric-like APES algorithm

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Abstract:

An interferometric-like APES algorithm is proposed for blind DOA estimation of interferometric arrays. The number of targets and coarse direction cosine estimates are obtained from the interferometric-like APES spatial spectrum and model-order selection criterion. The fine direction cosine estimates are derived from the phase center's shift of subarrays. A dual-size algorithm is used to resolve the ambiguity in DOA estimation, and then high accuracy and unambiguous DOA estimates are achieved. The proposed approach is a blind DOA estimation method with higher accuracy than MUSIC and dual-size ESPRIT algorithms. Simulation results and real data processing demonstrate high accuracy of DOA estimation of interferometric arrays and the validity and feasibility of the proposed method, which can provide reference for the design of the interferometric array.

Keywords: interferometric array blind direction of arrival estimation interferometric-like amplitude and phase estimate Bayesian information criterion disambiguation

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