

研究论文

双基地MIMO雷达高分辨角度估计

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摘要:

在高斯白噪声环境下, 针对双基地多输入多输出雷达点目标相对发射和接收阵列方位角DOD-DOA(Direction Of Departure-Direction Of Arrival)联合估计问题, 提出了一种新方法. 首先将点目标所在空间构建为一个关于到达角的二维密集字典, 将各个点目标在该密集字典进行投影得到各个点目标在该字典下的稀疏表示. 在稀疏性构建的前提下, 采用充分挖掘信号稀疏性的加权 l_1 范数最小化约束模型对点目标的角度信息进行求解. 为了使该算法在低信噪比情况下能够更稳健地重构各点目标的二维方位角, 对其权重进行了改进以达到抑制噪声的效果.

关键词: 双基地多输入多输出雷达 DOD-DOA 加权 l_1 范数

High resolution angle estimation of the bistatic MIMO radar

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Abstract:

A new method is proposed in this paper for jointly estimating the azimuths DOD-DOA (Direction of Departure-Direction of Arrival) of the targets in the bi-static MIMO scene under the circumstance of the Gaussian white noise. A two-dimension redundant dictionary is firstly constructed based on the bi-static MIMO scene where the targets are present. Then, the positions (DOD-DOA) of the targets are sparsely denoted as a sparse vector by projecting the positions of targets on the redundant dictionary. On the sparse model, an algorithm is applied for solving for the positions of the targets by solving the problem of minimizing the reweighted l_1 -norm of the sparse vector. For the algorithm to reconstruct the positions of the targets robustly under a low SNR, a modified weight is used in the algorithm.

Keywords: bi-static multiple-input multiple-output radar direction of departure-direction of arrival reweighted l_1 -norm

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