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# 一种双基地MIMO雷达三维多目标定位方法

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# A Method for Multi-target 3D Localization in Bistatic MIMO Radar

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摘要 该文针对发射天线为均匀线阵、接收天线为L型阵列的双基地MIMO雷达，提出了一种3维多目标定位方法。基于ESPRIT算法构造一个复矩阵，对其进行特征值分解后，根据特征值的虚部和实部估计出目标的接收角，根据特征向量进一步获得和接收角自动配对的目标发射角。该方法无需已知噪声的方差，且运算量较小。仿真结果表明，与其他方法相比，该文方法在信噪比较低时仍可有效定位目标，估值的均方误差较接近于克拉美罗界。

关键词：  MIMO雷达  双基地  多目标3维定位  复矩阵  特征值分解

Abstract:  An algorithm for multi-target three-dimensional (3D) localization in bistatic Multiple-Input Multiple- Output (MIMO) radar system with uniform linear transmit array and L-shape receive array is presented. After forming a complex matrix based on ESPRIT, the receive angles of each target can be calculated from the imaginary part and real part of each eigenvalue of that complex matrix. Then the transmit angles of each target can be obtained by utilizing eigenvectors of that complex matrix and signal subspace. The receive angles and transmit angle can be paired automatically. The proposed method does not need to know the variance of noise, and the computed load is low. Simulation results verify that the method is more effective in the low SNR condition, and the mean square errors of estimated angles are close to the Cramer Rao bound.

Keywords:  MIMO radar  Bistatic  Multi-target 3D localization  Complex matrix  Decomposition of eigenvalue

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