

锥面共形阵列信源方位和极化参数的联合估计算法

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Joint Estimation of 2D DOA and Polarization with Conical Conformal Array Antenna

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摘要

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摘要 该文用交叉电偶极子对在锥面共形载体表面构造极化敏感阵列, 在建立其快拍数据模型的基础上实现了信源方位和极化参数的联合估计。算法首先通过合理的矩阵变换将阵列流形中的信源方位和极化信息“去耦合”, 然后分别根据秩损理论和旋转不变子空间思想对其进行估计, 最后通过一种轮换比配对方法实现信源方位和极化参数的联合估计。Monte-Carlo仿真实验表明, 所提算法可以很好地解决锥面共形阵列的多参数联合估计问题。

关键词: 锥面共形阵列天线 参数联合估计 极化敏感阵列 旋转不变子空间

Abstract: A conical polarization sensitive conformal array is structured with crossed dipole elements and its data model is built, on the basis of which, a joint two Dimensional Directional Of Arrival (2D DOA) and polarization estimation algorithm is given. In the algorithm, the 2D DOA and polarization information of incident signals are de-coupled first through appropriate transformation to manifold matrix of the array, and then they are estimated separately according to rank reduction theory and Estimation of Signal Parameters via Rotational Invariance Techniques (ESPRIT) algorithm. The final result of joint 2D DOA and polarization estimation is achieved by employing a new designed alternative comparing parameter match algorithm. Monte-Carlo simulation results show that the proposed algorithm is competent to solve the multiple parameter estimation problem based on conical conformal array antenna.

Keywords: Conical Conformal Array Antenna (CAA) Joint parameter estimation Polarization sensitive array Estimation of Signal Parameters via Rotational Invariance Techniques (ESPRIT)

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