

防御电子技术

基于高斯—牛顿法改进的复合双基地雷达目标空间定位算法

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**摘要:** 针对复合双基地雷达系统的目标空间定位问题,提出了一种基于高斯-牛顿迭代的改进算法。该算法利用所有的观测数据构成非线性最小二乘定位方程,将精度最高的一组测量子集的解析解作为迭代初始值,从而比经验值更逼近真值,引入了变步长法使迭代迅速收敛,给出了应用该算法的具体步骤。仿真实验证明该算法提高了目标位置解的准确性,保证了迭代的收敛性。

**关键词:** 复合双基地雷达 目标定位 高斯-牛顿迭代法 定位精度

Algorithm of target location for complex bistatic radar system based on Gauss-Newton method

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**Abstract:** A new target location algorithm based on Gauss-Newton iterative algorithm for complex bistatic radar systems is developed. In the improved algorithm, all the observational data are adopted to compose a nonlinear least square equation, the location estimation resolved by a measurement subset which has higher accuracy among all subsets is utilized as an initialized value, which is close to the truth value. The iterative method of the variable step size is introduced, and the specific steps are given. Simulation shows the algorithm improves the accuracy of target location and ensures iterative convergence.

**Keywords:** complex bistatic radar target location Gauss-Newton iterative algorithm location accuracy

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参考文献:

- [1] 孙仲康,周一宇,何黎星.单多基地有源无源定位技术[M].北京:国防工业出版社,1996.
- [2] 何黎星,孙仲康.双基地及其联网系统的定位方法及定位精度分析[J].航空学报,1993,14(9):542-545.
- [3] 吴玲,刘忠,卢发兴.全局收敛高斯-牛顿法解非线性最小二乘定位问题[J].火控雷达技术,2003,32(1):75-80.
- [4] 李昌锦,陈永光,沈阳,等.一种计算双基地雷达探测区的新方法[J].系统工程与电子技术,2004,26(3):325-328.(Li Changjin, Chen Yongguang, Shen Yang, et al. New method for calculating detection coverage of bistatic radar[J]. Systems Engineering and Electronics, 2004, 26(3): 325-328.)
- [5] He You, Xiu Jianjuan, Wang Guohong, et al. Theorem for the combination of bistatic radar measurements using least square[J]. IEEE Trans. on AES, 2003, 39(4): 1441-1445.

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