

电子技术

多星TDOA和FDOA联合定位精度分析

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摘要:

推导了多星时差频差联合定位体制的定位误差下界(Cramér Rao lower bound, CRLB), 并给出CRLB能达到的最小值及其充要条件, 该充要条件可用于设计卫星构型。与采用GDOP(geometric dilution of precision)衡量联合定位性能方法相比, CRLB更能精确地反映多星时差频差联合定位的性能。理论分析及仿真实验证明了联合定位比单独利用时差或频差定位可以取得更高的定位精度。

关键词: 时差 频差 定位 克拉美罗下界

Analysis of precision of multi-satellite joint location based on TDOA/FDOA

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Abstract:

Cramér Rao lower bound (CRLB) is derived for multi satellite passive location based on time difference of arrival (TDOA) and frequency difference of arrival (FDOA) and its necessary and sufficient conditions are given. These conditions can be used to design an optimal shape of satellite array. Compared with geometric dilution of precision (GDOP), CRLB can better evaluate the performance of joint passive location. Both theory analysis and simulation prove the fact that the joint TDOA/FDOA location performs better than any one of TDOA and FDOA.

Keywords: time difference of arrival frequency difference of arrival location Cramér Rao lower bound

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