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基于脉冲星的航天器定位算法

吴 萌，刘 劲，马 杰，田金文

华中科技大学 图像所 多谱信息处理技术国家重点实验室，武汉 430074

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摘要 为了提高脉冲星空间定位精度和减少计算量，提出了一种新的脉冲星定位算法。该算法先用三颗脉冲星产生脉冲模糊点，再引入新的脉冲星消除脉冲模糊点直到脉冲整周数唯一。然后，采用TDOA定位技术消除航天器时钟的漂移。最后，利用最小二乘算法提高空间定位精度。实验结果表明，在半径为300 000 km的球形试探范围内，该算法处理时间小于4 ms，能较好地满足实时性的要求，并具有较高的定位精度。

关键词 脉冲星 定位 脉冲模糊点 抵达时间差

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Spacecrafts' position determination algorithm based on pulsar

WU Meng，LIU Jin，MA Jie，TIAN Jin-wen

Institute for Pattern Recognition and Artificial Intelligence State Key Laboratory for Multi-spectral Information Processing Technologies，Huazhong University of Science and Technology，Wuhan 430074，China

Abstract

In order to improve precision of spacecrafts' position determination based on pulsar and reduce amounts of computation，a novel position determination algorithm based on pulsar is presented.In this method，3 pulsars are selected to generate the possible ambiguity points，and new pulsars are used to eliminate ambiguity points until pulse period number is unique.Then，clock drift is eliminated by TDOA location technology.Finally，the least-squares method improves location precision. The simulation results show that calculation time is less than 4 ms in a tested sphere with radius of 300 000 km，and the requirement for real-time rendering can be satisfied.Moreover，this algorithm has high precision.

Key words pulsar location pulse ambiguity point Time Difference Of Arrival（TDOA）

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通讯作者 吴 萌