历元自差分的伪距定位算法

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摘 要： 针对单频伪距单点定位误差消除不干净，特别是电离层误差难以消除的问题，本文分析了伪距误差的组成，提出了利用误差的时间相关性来消除误差的历元间自差分法.针对广播星历误差大，精密星历不实时等问题，本文通过 IGS 提供的广播星历改正信息，实时修正广播星历得到的卫星位置偏差和钟差的偏差.本文分析了历元间自差分法的特点，得知历元间隔、初始点精度对其影响大，并用实测数据验证了这一观点.另外，通过与传统的单频伪距单点定位对比，可知在 1 秒历元间隔时，三维定位精度在 1.2 米左右，定位精度大幅提高.

关键词： 伪距单点定位；历元间自差分；伪距误差；广播星历误差；历元间隔

Single point positioning based on self-difference method

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Abstract： The error of single point positioning by single-frequency pseudorange is hard to eliminate, especially the ionospheric error does. In order to eliminate those errors, this paper analyzes the composition of the pseudo-range error and proposes the self-differential method between the epochs using the time correlation of the errors to eliminate them.In view of the problems of large broadcast ephemeris error and precise ephemeris not real-time, this paper corrects the satellite position deviation and the deviation of the clock difference obtained by the broadcast ephemeris,through the broadcast ephemeris correction information provided by IGS.In this paper, the characteristics of the self-differential method between epochs are analyzed. It is found that the epoch interval and the initial point precision have great influence on it, and the viewpoint is verified by the measured data.In addition, by comparing with the conventional single-frequency pseudo-single point positioning, it can be seen that the three-dimensional positioning accuracy is about 1.2 meters at a time interval of one second, and the positioning accuracy is greatly improved.

Key words： pseudorange single point positioning；self-differential method between the epochs；pseudo-range error；broadcast ephemeris error；epoch interval

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