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电离层不规则结构漂移的GPS测量及其初步结果

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摘要 本文阐述了利用GPS接收机台阵测量到的闪烁和TEC变化率ROT快速起伏图样估计F层不规则结构漂移的原理和方法,并利用实测数据估计了静日和暴时电离层不规则结构的水平漂移速度.短间距台网和超短间距台链观测实例的计算结果表明,暴时武汉地区引起TEC快速起伏的电离层不规则结构沿纬圈向西漂移,21:30至03:00 LT,西向漂移速度在约40 m/s至130 m/s的范围内变化;在桂林地区,磁静日午夜前后引起L波段电波闪烁的电离层不规则结构沿纬圈向东漂移,漂移速度从约70 m/s下降到约55 m/s,磁扰日午夜前不规则结构向西漂移,速度从约150 m/s下降到约50 m/s,午夜后转为向东漂移,速度从约25 m/s上升到约65 m/s.文中还提出了由单站多卫星观测估计F层不规则结构漂移的设想.实例分析与计算结果表明,利用单站多卫星观测估计电离层不规则结构漂移是一种合理可行的方法.

关键词 [电离层](#) [不规则结构](#) [漂移](#) [全球定位系统](#) [空间间隔接收机](#)

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GPS measurements of ionospheric irregularity drifts and their initial results

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Abstract Principle and methods on the estimation of F-layer ionospheric irregularity drifts based on scintillation and rapid-fluctuated TEC patterns measured from spaced-GPS receivers have been described, and the horizontal drift velocities of ionospheric irregularities on the quiet day and storm time have been estimated by using measured data. Based on analyses of observations from the short-spaced GPS receiver array at Wuhan, the storm-time ionospheric irregularities which resulted in scintillations and rapid TEC fluctuations showed westward drifts between 21 : 30 and 03 : 00 LT with drift velocities changing from ~40 to ~130 m/s. And based on analyses of observations from the ultra-short spaced GPS receiver chain at Guilin, ionospheric irregularities which resulted in the L-band radio wave scintillations, showed eastward drifts around local midnight ranging from ~70 to ~55 m/s on the quiet-day and westward drifts ranging from ~150 to ~50 m/s before the midnight and eastward drifts after the midnight ranging from ~25 to ~65 m/s on the disturbed day. The idea of the F-layer irregularity drift estimation based on single GPS receiver and multi-satellite observations has been proposed as well. A case study showed that it is feasible to estimate the ionospheric irregularity drifts with this method.

Key words [Ionosphere](#); [Irregularity](#); [Drift](#); [GPS](#); [Spaced receiver](#)

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