

利用GPS对磁暴期间极区TEC变化与极区碎片 (Polar Patches) 的研究

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摘要 利用2004年11月6~10日磁暴发生期间南极区域内的中国中山站GPS常年跟踪站 (ZHON) 和国际GPS服务站 (CAS1, MCM4, SYOG, MAW1) 的GPS观测数据, 计算了可观测卫星传播路径上的TEC和ROT值, 进而依据TEC的波动频率和幅度推估出极区碎片的个数, 分析了极区磁暴期间电离层响应及其极区碎片特性. 最终所得TEC和ROT结果与极区地磁场 D_{st} 和 K_p 指数信息相吻合, 如实地反映了磁暴事件和极区碎片的出现. 本文所做工作在国内外尚未开展, 因此所用方法和结论为将来这一方向的研究提供了一定的参考.

关键词 [磁暴](#), [极区碎片 \(polar patches\)](#), [GPS](#), [TEC](#), [ROT](#)

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Research of Polar TEC fluctuations and polar patches during magnetic storm using GPS

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Abstract Using the GPS observations from perennial GPS station in Zhongshan Station and IGS (International GPS Service) station (CAS1, MCM4, SYOG, MAW1) in the Antarctic region during a geomagnetic storm, November 6~10, 2004, TEC and ROT values along visible satellite passes are computed, then the number of polar patches are estimated based the frequency and amplitude of TEC fluctuations, furthermore, the polar ionospheric behavior and characteristic of polar patches during storms are analyzed. The derived conclusions are consistent with known characteristics of polar ionosphere detected by other instruments. The work done in this paper haven't been developed in our country, so there will be some guiding significance to future research work from the method and conclusions in this paper.

Key words [Magnetic storm](#) [Polar patches](#) [GPS](#) [TEC](#) [R](#)

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