

应用地球物理学

顾及板块运动、稳定性和系统偏差的高精度GPS监测基准研究与实现

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摘要 利用GPS技术监测城市地面沉降, 监测基准的合理选取对获得真实的形变结果至关重要. 本文详细分析了城市沉降监测网基准的特点, 针对传统基准模型的局限性提出了顾及板块运动、基准点稳定性以及其他系统误差影响的拟稳基准模型. 该模型考虑了基准点自身的稳定性以及板块运动对高程形变的影响, 同时采用系统参数统一各期基线框架以及区域拟稳基准, 有效解决了因基准点不稳定性和基线框架不一致对形变结果造成的误差, 确保正确形变信息的获取. 最后通过六期西安市地面沉降监测网数据试验, 验证了该方案的合理性和可靠性.

关键词 [基线框架](#) [GPS监测基准](#) [地面沉降](#) [板块运动](#) [系统参数](#) [拟稳基准](#)

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Research and realization of high-precision GPS datum, considering plate movement, stability and system errors

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Abstract It is essential to set a rational datum for the GPS adjustment of national or city-level subsidence monitoring. Based on the characteristics of the datum of urban GPS land subsidence network, and the shortage of traditional datum for the urban GPS land subsidence monitoring, this paper puts forward an enhanced quasi-stable datum model by considering the plate movement, stability of the base benchmarks and some other systematic effects. Owing to the consideration of the height effects from stability of base benchmarks and the plate movement and the unified GPS baseline frame and the quasi-stable datum for each epoch monitoring, this model can give reasonable deformation results by correcting the errors from instability of base benchmarks and inconsistent baseline frames of different monitoring epochs. Lastly six Xian GPS land subsidence monitoring datasets are tested and the rationality and feasibility of newly deduced model are verified.

Key words [Baseline frame](#); [GPS monitoring datum](#); [Land subsidence](#); [Plate movement](#); [System parameters](#); [Quasi-stable datum](#)

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