

空间物理学★测量学

利用最小二乘配置在球面上整体解算GPS应变场的方法及应用

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摘要 通过对位移与应变微分公式的分析, 给出了球坐标系下应用最小二乘配置法由GPS数据整体解算应变场的方法. 首先, 对模拟数据的理论应变场与采用全部采样数据和随机抽取50%限定采样数据的应变场结果的对比分析, 初步验证了最小二乘配置球面整体解应变场方法的有效性. 然后, 利用1999~2001和2001~2004两期中国大陆区域网GPS速度场数据给出了基于最小二乘配置球面解获得的应变率场结果, 概要分析了此期间中国大陆应变率场的动态变化. 最后, 讨论了最小二乘配置在球面上计算应变场需要注意的问题和建议.

关键词 [最小二乘配置](#) [球面GPS应变场](#) [模拟数据](#) [动态演化](#)

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The application and method of GPS strain calculation in whole mode using least square collocation in sphere surface

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Abstract By analysis of the coefficient formulas between displacement and strain, the whole solving method using least square collocation in sphere reference frame for calculating strain field from GPS data is propounded. In this paper, the theoretical strain field and calculated strain field with simulated data are given. In this simulating process, the whole sampling data and 50% constraining sampling data are used as simulating input. On the basis of comparing the theoretical results and calculated results, the strain calculation method is tested effectively. Meanwhile, we analyze the GPS strain rate field of regional network in China Mainland using 1999~2001 and 2001~2004 GPS velocity fields and give the dynamic evolution of strain rate distribution of China Mainland. Lastly, some advice of strain calculation using least square collocation is given.

Key words [Least square collocation](#); [GPS strain field in sphere surface](#); [Simulation data](#); [Dynamic evolution](#)

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