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论文

南半球减速膨胀的定量分析

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摘要: 利用空间大地测量技术的长期观测资料, 得出南半球纬线圈纬线长变化率和全球活动板块边缘扩张与汇聚运动速率, 并与3Ma平均地质地磁模型NUVEL1A的估算结果进行比较: (1)空间大地测量技术测得南半球纬线圈纬线变化率均为正值; (2)南半球测站的垂向运动除了赤道附近几个测站下沉, 其余91个的台站全上升; (3)南半球相邻板块的现今汇聚和扩张运动速率均比3Ma平均地质模型NUVEL1A估值小, 而北半球相邻板块的汇聚和扩张运动速率没有系统性的变化. 这些实测结果反映了南半球纬线圈方向在减速伸展, 南北方向在减速拉伸, 即南半球在减速膨胀.

关键词: 空间大地测量 南半球 膨胀 欧拉参数

QUANTITATIVE ANALYSIS OF THE SLOWING EXPANSION IN THE SOUTHERN HEMISPHERE

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Abstract: The closed differences of the latitude length changing rates at the latitude circle direction in the Southern Hemisphere and the convergent and spreading rates at global active plate boundaries are obtained from space geodetic data spanning 20 years. Comparing these results with NUVEL1A predictions averaged the past 3Ma shows

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that: (1) the closed differences of the latitude length changing rates at the latitude circle direction in the South Hemisphere are all positive; (2) 91 percent of sites in the Southern Hemisphere move up vertically, except several sites near the equator region; (3) the present day spreading and convergent rates at active plate boundaries in the Southern Hemisphere are systemically smaller than NUVEL1A predictions averaged 3Ma, while the changes of relative motions in the North Hemisphere are disorderly and unsystematic. All these show the present day motion characteristics of the Southern Hemisphere that is expanding with a slowing down trend.

Keywords: Space geodesy Southern Hemisphere Expansion Euler parameter.

收稿日期 2002-04-18 修回日期 2003-05-16 网络版发布日期

DOI :

基金项目: