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中国大陆重力场动态变化研究

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Study on dynamic change of gravity field in China continent

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摘要

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摘要 利用国家重大科学工程“中国地壳运动观测网络”1998—2008年间绝对重力和相对重力的观测资料,初步获得了中国大陆起算基准统一的重力场及其动态变化.重力场变化既具有时空分布的不均匀性和重力变化分区现象,同时又具有与活动断裂构造密切相关和与地震孕育发展有着内在联系.中国大陆6.8级以上大震主要发生在重力场变化分布差异较为剧烈的地区(重力变化 $\geq 90 \times 10^{-8} \text{m} \cdot \text{s}^{-2}$)和重力变化发生转折的时段.

关键词 中国大陆, 重力观测, 重力变化, 构造活动, 地震

Abstract: This paper reports preliminary results about gravity field changes in mainland China from 1998 to 2008 based on information derived from absolute and relative gravity observation data at stations of the Crustal Movement Observation Network of China (CMONOC). These results suggest that: (1) there existed significant inhomogeneity in the spatial-temporal distribution of gravity changes in China and partition phenomenon; (2) significant gravity changes appear to be concentrated in regions with active faults and associated with the preparation of large earthquakes; (3) the majority of large earthquakes ($\geq M_s 6.8$) in mainland China occurred in areas that exhibited significant differences of gravity changes of $90 \times 10^{-8} \text{m} \cdot \text{s}^{-2}$ or greater, and these earthquakes typically ruptured around the time when the trend of gravity change in the region showed signs of reversal.

Keywords China Continent, Geodesy, Gravity, Tectonics, Seismology

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