地球物理学报 2004 47 (6): 1053～1060 ISSN: 0001-5733 CN: 11-2074/P

论文

岩石圈根拖曳作用在青藏高原西部和东部造山中的比较研究

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收稿日期 2003-12-2 修回日期 2004-7-21 网络版发布日期 接受日期

摘要 根据地球物理探测资料，基于二维模型，利用黏弹性有限元方法，研究青藏高原西、东剖面的地壳均衡和岩石圈根拖曳的构造应力机制.数值模拟结果表明，青藏高原西部（B B′剖面）的造山水平挤压力主要来源于岩石圈根的向下拖曳，印度板块向北挤压为次要因素，形成“山隆盆降”的地表形态；而青藏高原东部（A A'剖面）岩石圈根向下拖曳还不足以形成硬上地壳中挤压造山的主要力源.对比结果认为，青藏高原的深部层圈结构和应力体系在西、东部存在明显的差异，反映了高原内部造山演化的西、东分异特征.

关键词 青藏高原 岩石圈根 有限元数值模拟 构造应力 造山

分类号

DOI:

A comparative study on the effect of a down pulling lithospheric root beneath the West and East collision mountain ranges in the Qinghai Tibet plateau.

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Received 2003-12-2 Revised 2004-7-21 Online Accepted

Abstract In order to understand the tectonic stress mechanism caused by crust equilibrium and lithospheric root pull in the West and East Qinghai Tibet plateau, two dimensional viscoelastic models are established and computed on the basis of geophysical data. The results show that the horizontal deviatoric compression mainly comes from the down pulling lithospheric root and the northward convergence of the Indian plate is secondary in the West Section, forming the topography “mountain rising and basin sinking”.While the horizontal deviatoric compression in the rigid upper crust induced by the down pulling lithospheric root is still poor in the East Section. By comparing the numerical modeling results, the difference of deep material and tectonic stress system may imply different evolution stages of mountain uplift in the West and East Qinghai Tibet plateau.

Key words Qinghai Tibet plateau;Lithoshperic root;Finite element numerical modelling;Tectonic stress;Orogenesis.

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