A Big Earth Data Platform for Three Poles

**Subsidence and exhumation of the Mesozoic Qiangtang Basin: implications for the growth of the Tibetan Plateau**

1、Description

The subsidence and exhumation histories of the Qiangtang Basin and their contributions to the early evolution of the Tibetan plateau are vigorously debated. This paper reconstructs the subsidence history of the Mesozoic Qiangtang Basin with eleven selected composite stratigraphic sections and constrains the first stage of cooling using apatite fission track data. Facies analysis, biostratigraphy, paleo-environment interpretation, and paleo-water depth estimation are integrated to create eleven composite sections through the basin. Backstripped subsidence calculations combined with previous work on sediment provenance and timing of deformation, show that the evolution of the Mesozoic Qiangtang Basin can be divided into two stages. From Late Triassic to Early Jurassic times, the North Qiangtang was a retro-foreland basin. In contrast, the South Qiangtang was a collisional foreland basin. During Middle Jurassic to Early Cretaceous times, thrust belt loading from the Jinsha River suture drove development of the combined retro-foreland basin. Detrital apatite fission track ages concentrate in late Early to Late Cretaceous (120.9-84.1 Ma) and Paleogene-Eocene (65.4-40.1 Ma). Thermal history modelling results record Early Cretaceous rapid cooling; the termination of subsidence and onset of exhumation of the Mesozoic Qiangtang Basin suggest that the accumulation of crustal thickening in central Tibet probably initiated during Late Jurassic-Early Jurassic (150-130 Ma), involving underthrusting of both the Lhasa and Songpan-Ganze terranes beneath the Qiangtang terrane, or the collision of Amdo terrane.

2、Keywords

Theme：Rocks/Minerals,neotectonics,Tectonics,apatite  
Discipline：Solid earth  
Places：Tibet  
Time：Late Cretaceous

3、Data details

1.Scale：None

2.Projection：

3.Filesize：0.8MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：34.0 | - |
| west：88.0 | - | east：92.0 |
| - | south：32.0 | - |

5、Time frame:None--None

6、Reference method

References to data:

ZHANG Jiawei, HAN Zhongpeng, LI Yalin. Subsidence and exhumation of the Mesozoic Qiangtang Basin: implications for the growth of the Tibetan Plateau. A Big Earth Data Platform for Three Poles, doi:10.1111/bre.123432021

References to articles:

Zhang, J., Sinclair, H. D., Li, Y. Wang, C., Persano, C., Qian, X., Han, Z., Yao, Y., & Duan, Y. (2019). Subsidence and exhumation of the mesozoic qiangtang basin: implications for the growth of the tibetan plateau. Basin Research, 31(4), 754-781.

7、Supporting project information

Second Tibetan Plateau Scientific Expedition Program

8、Data resource provider

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