A Big Earth Data Platform for Three Poles

**Thermochronologic data of tectonic exhumation in the Tibetan Plateau and vicinities**

1、Description

The age constraints for Cenozoic exhumation history of the northern Tibetan Plateau provides evidence for growth process of the plateau and interaction process of tectonics-climate-erosion in this region. Apatite fission track thermochronology has a relative lower closure temperature of ~100 °C, thus is capable of recording the exhumation process of upper crust. We collected 26 sedimentary samples in the Hongliugou section in northern Qaidam Basin, which consist of strata from the Lulehe Formation to Shizigou Formation. These samples were fission track dated using the external detector method in the Northwest Institute of Eco-Environment and Resources, Chinese Academy of Sciences. The result shows fission track central age of these samples range in 36.4 ± 2.0 Ma to 78.0 ± 2.8 Ma. Most of our sample failed the chi-square test, indicating a mixture of multiple sources with different cooling ages. We use the binomial fitting method to decompose the mixture single-grain ages and obtained 55 age components. Decomposed component age of these detrital samples ranges in 21.2 ± 2.9 Ma to 102.8 ± 9.0 Ma. Integrated analysis of the fission track ages and confined track length indicates that samples in the upper 2500 m of the section had not affected by burial annealing after deposition, while that in the lower 2500 m were partial annealed after deposition. Unannealed fission track ages showing “static peaks” in ~60-50 Ma and ~40-36 Ma, which indicates the source of these detritus, the Qilian Shan, have experienced significant rock exhumation in these two stages in respective. This study suggests that tectonic deformation initiated in the northern Tibetan Plateau in early Cenozoic, which synchronous with India-Asia collision. Thus we suggest the Qilian Shan serves as the northern boundary of the Tibetan Plateau since the early Cenozoic.

2、Keywords

Theme：Tectonics,Thermochronology
Discipline：Solid earth
Places：Northern Qaidam Basin
Time：Cenozoic

3、Data details

1.Scale：None

2.Projection：None

3.Filesize：0.13MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：39.0 | - |
| west：93.0 | - | east：97.0 |
| - | south：37.0 | - |

5、Time frame:None--None

6、Reference method

References to data:

HE Pengju, SONG Chunhui. Thermochronologic data of tectonic exhumation in the Tibetan Plateau and vicinities. A Big Earth Data Platform for Three Poles, doi:10.11888/SolidEar.tpdc.2718532021

References to articles:

He, P., Song, C., Wang, Y., Wang, D., Chen, L., Meng, Q., & Fang, X. (2021). Early Cenozoic activated deformation in the Qilian Shan, northeastern Tibetan Plateau: Insights from detrital apatite fission‐track analysis. Basin Research, 33(3), 1731-1748.

He, P., Song, C., Wang, Y., Zhang, Y., Chen, W., Meng, Q. & Zhao, Y. (2021). Intensified Late Miocene Deformation in the Northern Qaidam Basin, Northern Tibetan Plateau, Constrained by Apatite Fission-Track Thermochronology. Frontiers in Earth Science, 9, 750993.

7、Supporting project information

The Second Tibetan Plateau Scientific Expedition and Research
Strategic Priority Research Program of Chinese Academy of Sciences Pan-Third Pole Environment Study for a Green Silk Road (Pan-TPE)

8、Data resource provider

name: SONG Chunhui
unit:
email: songchh@lzu.edu.cn

name: HE Pengju
unit:
email: hepj@lzu.edu.cn