

## **Tectono-Thermal Evolution of Ningwu-Jingle Basin in North China Craton: Constraints from Apatite (U-Th-Sm)/He and Fission Track Thermochronology**

**Authors :** Zhibin Lei, Minghui Yang

**Abstract :** Ningwu-Jingle basin is a structural syncline which has undergone a complex tectono-thermal history since Cretaceous. It stretches along the strike of the northern Lvliang Mountains which are the most important mountains in the middle and west of North China Craton. The Mesozoic units make up of the core of Ningwu-Jingle Basin, with pre-Mesozoic units making up of its flanks. The available low-temperature thermochronology implies that Ningwu-Jingle Basin has experienced two stages of uplifting:  $94 \pm 7$ Ma to  $111 \pm 8$ Ma (Albian to Cenomanian) and  $62 \pm 4$  to  $75 \pm 5$ Ma (Danian to Maastrichtian). In order to constrain its tectono-thermal history in the Cenozoic, both apatite (U-Th-Sm)/He and fission track dating analysis are applied on 3 Middle Jurassic and 3 Upper Triassic sandstone samples. The central fission track ages range from  $74.4 \pm 8.8$ Ma to  $66.0 \pm 8.0$ Ma (Campanian to Maastrichtian) which matches well with previous data. The central He ages range from  $20.1 \pm 1.2$ Ma to  $49.1 \pm 3.0$ Ma (Ypresian to Burdigalian). Inverse thermal modeling is established based on both apatite fission track data and (U-Th-Sm)/He data. The thermal history obtained reveals that all 6 sandstone samples cross the high-temperature limit of fission track partial annealing zone by the uppermost Cretaceous and that of He partial retention zone by the uppermost Eocene to the early Oligocene. The result indicates that the middle and west of North China Craton is not stable in the Cenozoic.

**Keywords :** apatite fission track thermochronology, apatite (u-th)/he thermochronology, Ningwu-Jingle basin, North China craton, tectono-thermal history

**Conference Title :** ICSGDT 2017 : International Conference on Structural Geology and Dynamic Tectonics

**Conference Location :** Venice, Italy

**Conference Dates :** February 16-17, 2017