

Tectonic evolution of the Mesozoic
Songpan-Ganze orogenic belt in the
eastern margin of Tibetan plateau:
constraints from structural analyses and
 ^{40}Ar - ^{39}Ar dating

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The Songpan-Ganze Orogenic belt (SOGB) in the Tibetan plateau was a consequence of the collision between the South China block and the North China block during Triassic time [1-3]. The Jianglang, Danba and Xuelongbao tectonic domes form an extensional belt along the eastern part of the SOGB and are composed of three units: core, middle ductilely slab and cover. Supracrustal paragneisses, mica-schist, and quartzite comprise cores of these domes and contain multi-stages of foliation and metamorphic mineral assemblages, whereas the Paleozoic to Triassic cover sequences have thicknesses ranging from 30 to 40 km with only a contractional foliation. The ductilely middle slabs, separating the core from the cover, are composed of mylonite with S-C fabric, intralayer fold and metamorphic mineral assemblage of garnet -biotite -muscovite -quartz -plagioclase of greenschist facies metamorphism. They have variable thicknesses from centimeters to kilometers and show ESE-ward extensional senses.

Amphibole separates yield well defined ^{39}Ar - ^{40}Ar plateau ages of 176 ± 0.68 Ma for the slab of the Jianglang dome (LS2), 161 ± 0.7 for the slab of the Xuelongbao dome (BM29) and 173 ± 12 Ma, 170 ± 10 Ma and 166 ± 9 Ma (GZ-5), and 159 ± 14 Ma (DB-8) for the slab of the Danba dome, consistent with SHRIMP zircon (metamorphic rims) U-Pb ages of 175 ± 3 and 176 ± 2 Ma [1, 4]. We conclude that the tectonic evolution of the SOGB involved the Triassic compression to Jurassic extension which resulted in the selective removing or thinning of the middle slab at 159-176 Ma.

References

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