

THE KINEMATIC CHARACTERISTICS OF THE WUGONGSHAN METAMORPHIC TERRANE IN KIANGXI PROVINCE, CHINA

SUN Yan, Shu Liangshu, Dai Cunsen, Zhong Futai

(Department of Earth Sciences, Nanjing University, Nanjing 210008, P.R. of China)

The Wugongshan terrane is located in the northern Kiangxi Province, China (Fig. 1), and it lies in between the Jiangnan Proterozoic composite terranes and the Wuyi-Yunkai early Palaeozoic island-arc system. The rock assemblages of the Wugongshan Metamorphic Terrane consist of gneiss, gneissose-mylonite, schist and low metamorphic rocks of the pre-Devonian, and it was bounded by some large scale fault zones. Obviously this terrane has its own geological history that is quite different from the surrounding terranes.

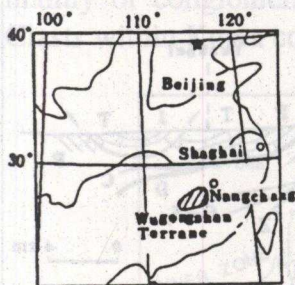


Fig. 1: Location of the
Wugongshan
Metamorphic terrane
in eastern China.

There were some layer slip-dip slip faults which occurred in the incompetent beds in the Wugongshan terrane area, such as those separating Upper Proterozoic, Lower Cambrian and Silurian etc. In order to quantitatively studying the layer slip-dip slip fault and completely analysing the regional detachment structures, the parameters of the rocks mechanics, physical properties and rock rheology have been determined systematically. These parameters include compressive strength of rock, shear strength, tensile strength, Young's module, Poission ratio, density, interfriction angle, magnetic susceptibility, wave velocity, dislocation density

and flow stress. Of course all of them reflect the characteristics of the layer slip-dip slip systems.

During the early Paleozoic period, the Caledonian cycle whose isotopic age was determined to be 410 Ma, showed an intense compressive orogenesis, and the Wugongshan terrane came into collision with the Jiangnan Proterozoic island-arc system. In the process of amalgamation with the Jiangnan composite terranes, the Wugongshan terrane developed

the stack structures or stack mountain systems, meanwhile a tectonic kind of the stack mountain which is named the opposite type has been distinguished.

The Wugongshan terrane has undergone orogenic cycles of broad scope since the Proterozoic Era. Otherwise it should be stressed that the tensile action after the Indosinian cycle (Triassic Period) is especially obvious. The mechanical transformation of the layer slip-dip slip fault zone from compressive to tensile and from inverse to normal sliding have been well recognized. Specifically, they can occur in some complex structural phenomena which indicate the fore-nappes, the after-glidings, and the compression-extension in the same slipping planes (Fig. 2). The transformation of the mechanical nature of the dip slip may be attributed to the changes of the regional, adjustable and local structural stress fields.

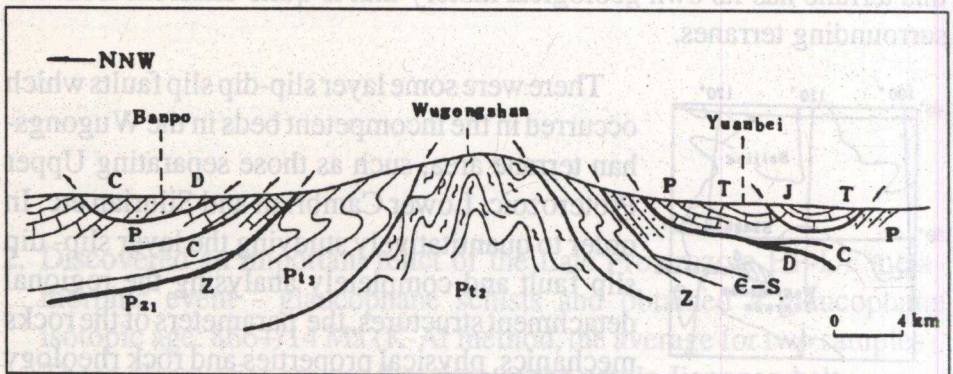


Fig. 2. The schematic cross section of the Wugongshan terrane showing the tensile extension structures after the collision orogeny period.

The authors apply a nonlinear theory to study the slip system of the opposite type in the Wugongshan terrane area, and have finished the program of the two dimensions with the elastic-plastic nonlinear analysis.

As mentioned above the kinematic characteristics of the Wugongshan terrane is typical and possesses the representative phenomena in metamorphic terranes of the pre-Devonian in southeastern China.