

Characteristics of Fault Development in Yuqi Area

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Abstract

Based on the three-dimensional seismic data in Yuqi area, the analysis method of strike-slip fault structure is used to determine the development characteristics of the fault system in Yuqi area, and the evolution characteristics and active stages of faults are discussed in combination with the regional dynamic background. Research indicates. Strike-slip faults mainly include NE, NEE, and SN directions, and the faults in each direction are different in geometric characteristics, kinematics, and structural evolution. The NE-trending fault is characterized by left-hand strike-slip, which was active again in the late Caledonian period, continued to be active in the Hercynian period, and may be active in the Indosinian-Yanshan period. Taking the Yuqi 9 fault as an example, it was formed in the mid-Caledonian stage, and continued to be active in the mid-late Hercynian stage, but not active after the Indosinian period. Taking the Yuqi 11 fault as an example, the SN-trending fault is used to analyze its strike-slip characteristics. It is a left-hand strike-slip, and its activity is analyzed.

Keywords

Strike-slip Fracture, Vertical Break, Yuqi Area.

1. Introduction

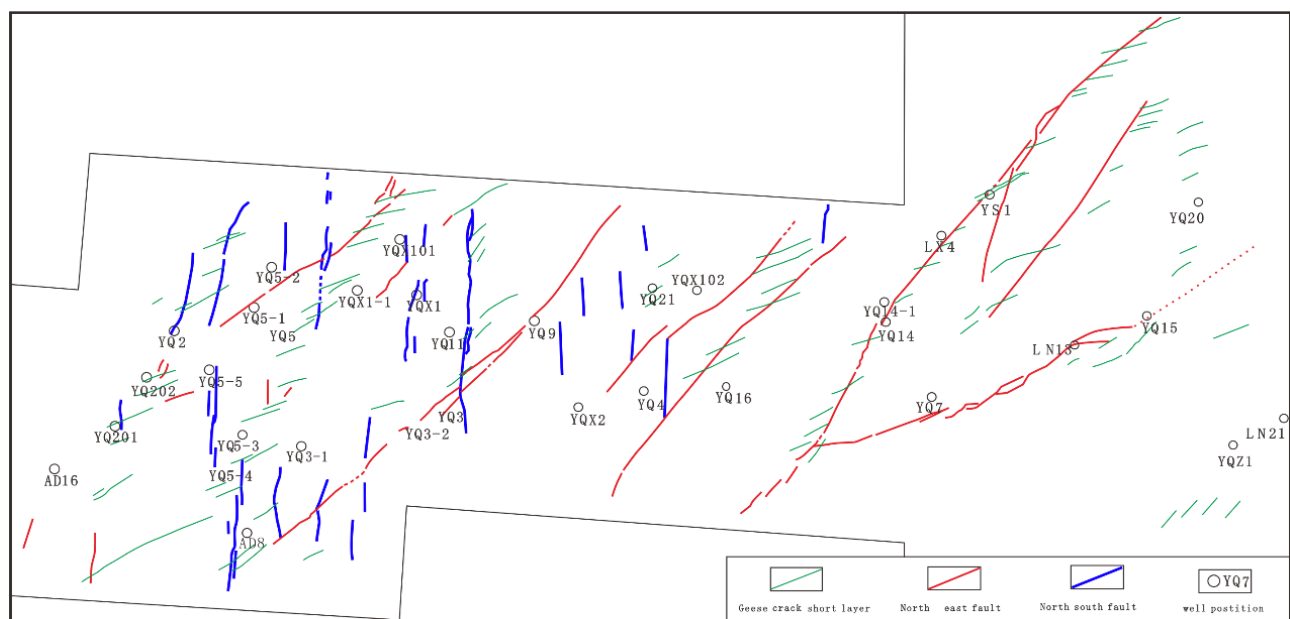


Figure 1. The layout of the fault distribution of the T78 interface superimposed on the T40 interface in the central and western Yuqi

The Yuqi area is adjacent to the Luntai fault on the northern border of the Tabei Uplift[1-2]. It is different from the main area of the Tahe River and the subsalt area. The strike-slip fault

system in the Yuqi area is mostly from northeast to strike-slip and A non-conjugated fault system composed of nearly north-south strike-slip. The north-east trending faults are the main faults, and the north-south trending faults are mostly restricted to develop between the north-east trending faults. The scale and level are small. In addition, there are also north-east trending faults in Yuqi area. [3-4]Fracture development. The faults in the Yuqi area also showed the characteristics of multi-phase activity. The early two groups of faults showed left-traveling characteristics, and they reversed during the Yanshanian-Himalayan period[5-6]. A clear echelon normal fault distribution can be seen at the T40 interface (Figure.1) . The main main faults developed in Yuqi area are Yuqi 5 fault, Yuqi 9 fault, Lunxi 4 fault, Yuqi 20 west fault, and Yuqi 9 fault is a large-scale main fault in Yuqi area[7-9]. Now select typical strike-slip faults, Yuqi 9 fault, Yuqi 11 fault, and Yuqi 20 west fault for fine analysis.

2. Yu Qi 9 Fracture

The Yuqi 9 fault is located in the middle of the Yuqi area, and the fault strikes southwest-north east. Based on the interpretation of the main interface coherence diagrams and cross-fault sections, it is believed that the Yuqi 9 fault has the characteristics of plane segmentation and vertical layered deformation. Under the system salt, it can be seen that the T90 interface fracture basically does not have the characteristics of segmentation, the activity intensity is relatively strong overall, and the associated fractures are developed parallel to it. The T81 interface has shown significant segmentation characteristics, and the fault distribution in the Mesozoic and Cenozoic is sporadic[10-11]. An echelon normal fault formed during the late period of the fault (Figure.2).

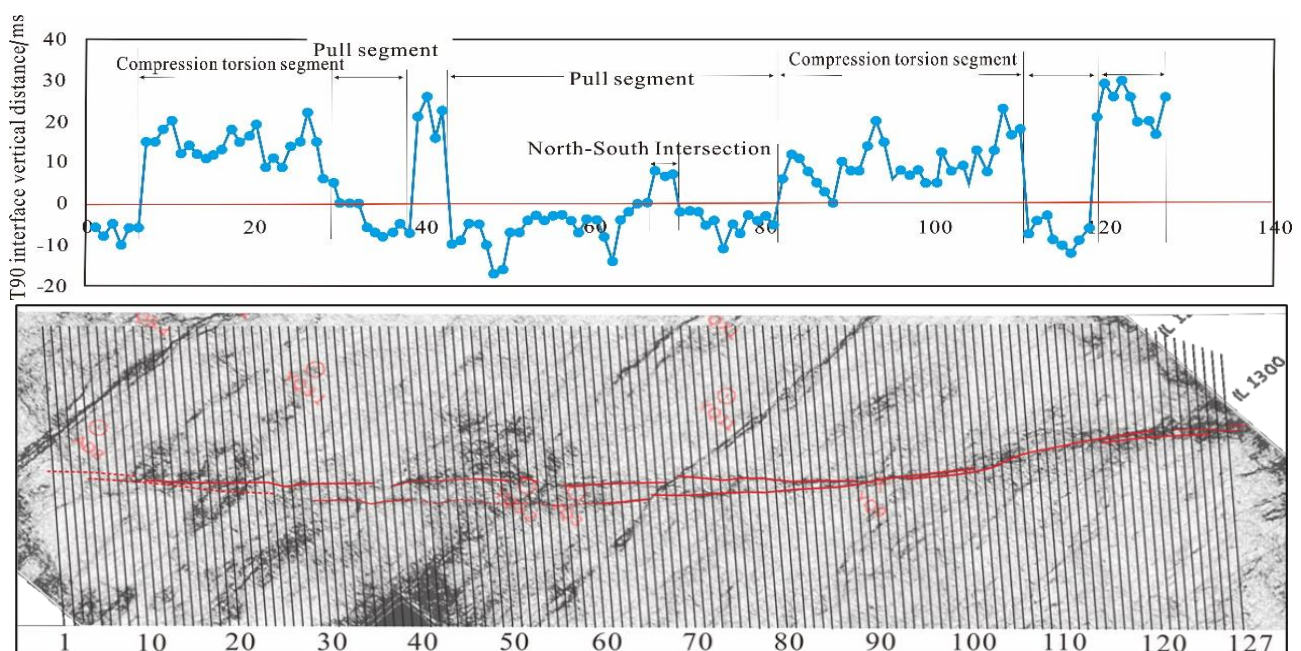


Figure 2. The statistics and segmentation characteristics of the vertical fault distance at the T80 interface of the Yuqi 9 fault

The Yuqi 9 fault has shown significant segmentation characteristics at the T81 interface. The T80 and T78 interfaces have similar segmentation characteristics. Along the fault direction, the fracture exhibits strong pressure uplift and weak pull-off characteristics on the overall segmentation. T80 interface The vertical fault distance is between -18ms and -30ms. At the intersection with the north-south fault, the fault shows the characteristics of being disturbed by the north-south fault activity. Most of the faults in the north are characterized by penetration

development from bottom to top, and to the south, they are characterized as lateral connections in the vertical direction. The upper and lower Cambrian salt shows the characteristics of layered deformation. At the same time, the northern faults form branch faults on the section. The level is also older. According to the statistics of the vertical fault distance of the T80 interface, the fault can be divided into 4 swelling sections and 3 tension sections on the plane, a total of seven strain sections.

The length of the tension section is usually shorter and the break distance is also smaller. The compression section is characterized by a larger break distance and a larger splicing length (Figure.3).

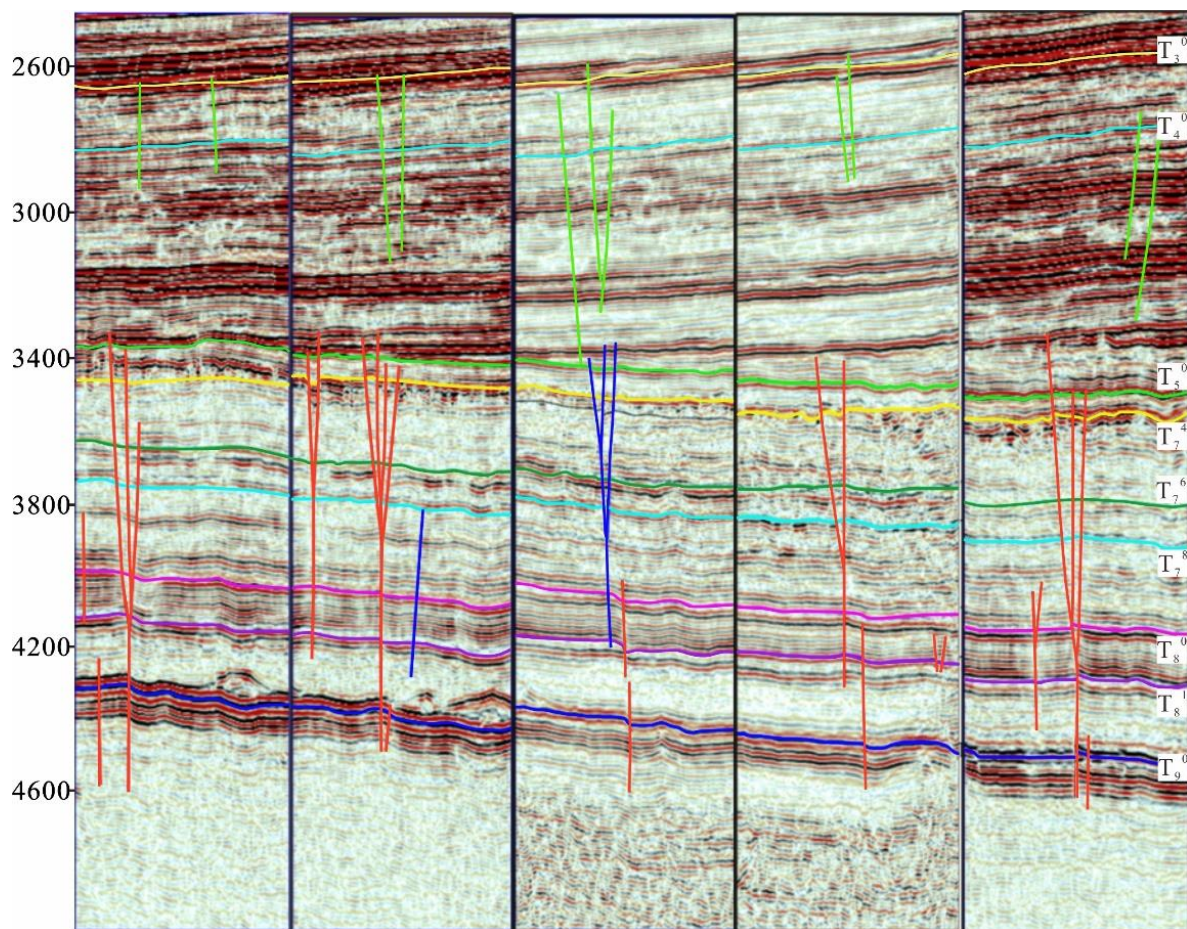


Figure 3. Explanation of the typical section of the Yuqi 9 fault

According to the characteristics of the north-east-trending fault of the T81 coherence interface being a north-south fault, it can be inferred that the north-south fault has a late activity period and exhibits a left-hand-slip characteristic, which is that the right-step superimposed section of the Qi 9 fault appears to be an uplift. The characteristics of the left-step overlapped section show a pull-off feature, so it can be inferred that the Yuqi 9 fault also shows a left-line feature. According to the characteristics of the fracture development in the profile, the Yuqi 9 fault mostly breaks through the T50 interface upwards, and shows the characteristics of layered deformation in the upper salt and sub-salt. In the Mesozoic and Cenozoic echelon normal faults, most of the echelon faults pierce the bottom of the T30 interface. The arrangement shows that it is characterized by right-traveling activities. Therefore, it can be concluded that the Qi 9 fault was mainly active in the late Hercynian period. It had a rudimentary form in the Caledonian. The early activities showed a left-traveling feature and reversed performance during the Yanshanian-Himalayan period. It is the right row feature.

3. Yu Qi 11 fracture

The Yuqi 11 fault is located in the Yuqi area. It appears as a north-south-trending fault on the plane. The Yuqi 11 fault can be seen intermittently on the T90 interface coherence map, and it is mainly distributed between the north-east-trending main faults on the north and south sides of the fault. To the T78 interface, it can be seen that the continuity of the fault has become better, and the main fault in the north-east direction has been cut, and at the same time, the interface shows obvious segmentation characteristics. To the upper T40 interface, there can be an echelon normal fault along the north-south direction. Spread out (Figure 4).

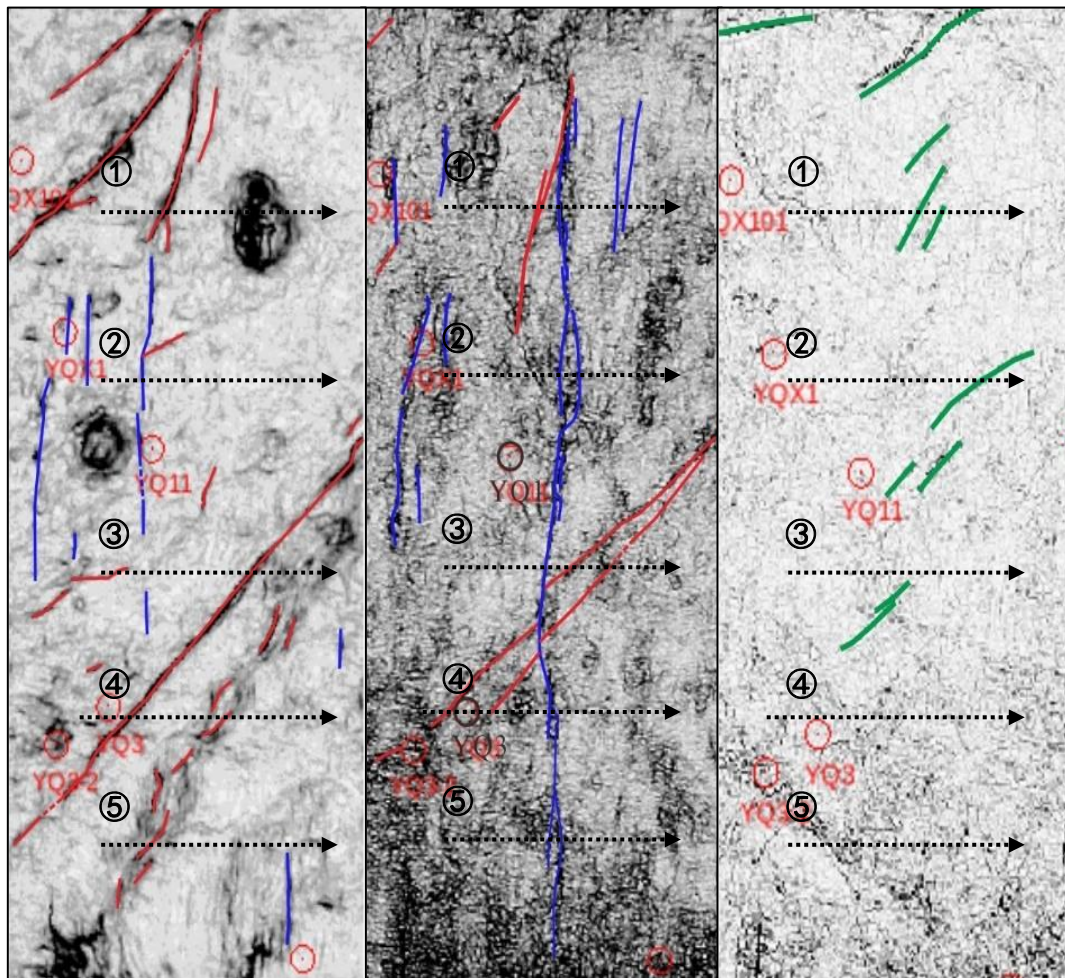


Figure 4. The main interface fracture distribution characteristics of Yuqi 11 fault

Yuqi 11 is the largest north-south-trending fault in the Yuqi area. From the comparison of the distribution characteristics of the main interfaces, it can be seen that the Yuqi 11 fault is weakly developed in the deep and has strong activity in the salt carbonate formation. After many periods of activity, the statistical results of the vertical fault distance of the T78 interface show that the fault has significant planar segmentation characteristics, which are characterized by north-uplifting and south-stretching as a whole. The northern end of the fault zone is affected by the north-north direction Influenced by the spread of secondary faults, the northern part of the fault zone shows strong uplifting characteristics, and significant overlap characteristics can be identified at the T78 interface. Combining the statistical results of the fault distance, it can be divided into four overlap tension segments and three There are two overlapped uplift sections, two translational sections, and interference sections at the intersection with the NE-trending fault (Figure.5).

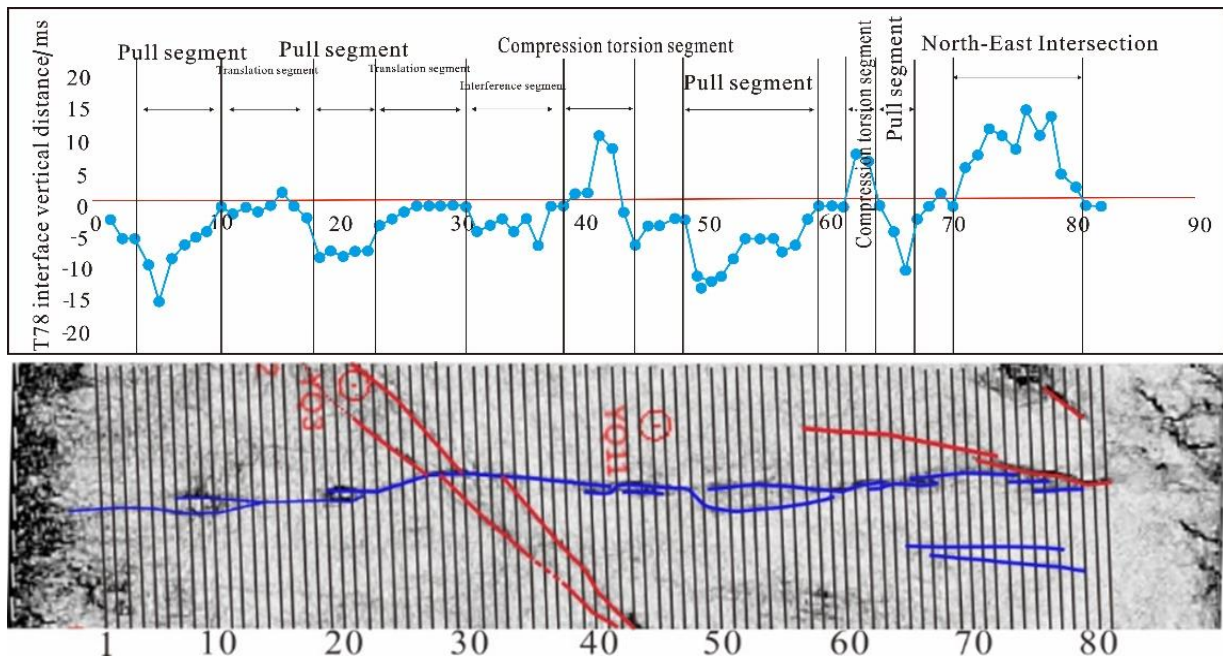


Figure 5. Statistics and segmentation characteristics of vertical fault distance at the T80 interface of Yuqi 11 fault

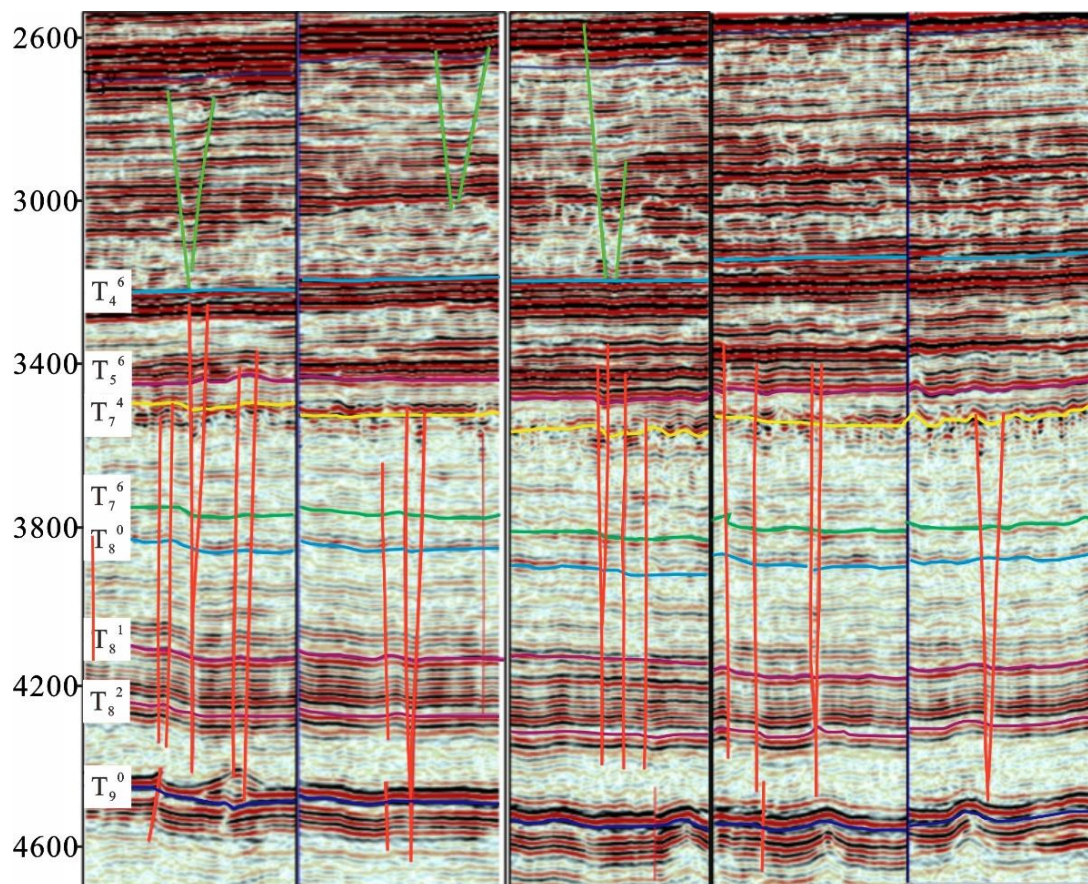


Figure 6. Explanation of typical section of Yuqi 11 fault

It can be seen from the sections of the Tooqi 11 fracture that most of the Yuqi 11 fractures did not break to the T90 interface, and most of the fractures showed branching characteristics at the T84 interface, cutting through the T_5^0 interface or even the vicinity of the T_4^6 interface to the upper part. At the same time, it can be seen on the plane that the Yuqi 11 fault cuts through

and discontinues the northeast-trending Yuqi 9 fault in the middle, combined with the intermittent distribution of the Yuqi 11 fault on the T_9^0 interface, and is more developed in the upper layer. In the late period, along its strike, it has the characteristics of the distribution of the echelon normal fault. It can be inferred that the Yuqi 11 fault may have formed and was active in the late Hercynian period, and recurred during the Yanshanian-Himalayan period. It was distorted by the characteristics and overlap of the Yuqi9 fault. The uplift or fall of the strata in the section indicates that the Hercynian period shows the characteristics of leftward movement. Based on the distribution characteristics of the late geese, it can be inferred that its activities in Yanshan-Himalayan show the characteristics of rightward movement (Figure.6).

4. Conclusion

Two groups of strike-slip faults are mainly developed in the Yuqi area, which are NE-trending and north-south-trending, with NE-trending main faults. The strike-slip faults in this area show that the north-east and north-south strike-slip faults intersect but are not conjugate, and are the characteristics of the north-south strike-slip faults significantly distorting the north-east strike-slip faults. Taking the northeast-trending Yuqi 9 fault, the west Yuqi 20 fault and the north-south Yuqi 11 fault as examples, the characteristics of fault development are analyzed on the basis of fine analysis. think:

(1) The Yuqi 9 fault has the characteristics of horizontal segmentation and vertical stratification in spatial morphology, and the characteristic of left-hand-slip in the early stage of the fault is reversed to the right-hand-slip in the later period.

(2) The Yuqi 11 fault is the largest north-south fault with obvious features of plane segmentation. The fault was formed and active in the late Hercynian period, showing the characteristics of left-hand strike-slip, and reversed to right-hand strike-slip during the Yanshan-Himalayan period.

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