



Characteristics of structural transfer zone in Western Foothills, southwestern Taiwan

Ho Yeh (1), Kenn-ming Yang (1), Yih-Min Wu (2), Wen-Shan Chen (2), Siao-Syun Ke (3), and Ching-Weei Lin (1)

(1) National Cheng Kung University, College of Science, Earth Science, Taiwan, (2) National Taiwan University, College of Science, Geosciences, Taiwan, (3) National Science and Technology center for disaster reduction, Taiwan

Structural transfer zone in the foothills marks the end point of a major thrust and is manifested by lateral transfer of displacement, slip surface and structural styles from one to another thrust. In a larger scale, the structural transfer zone is the transition zone between two adjacent segments of thrust system. The existence of a structural transfer zone may shed some influence on potential lateral length and/or trend of a surface rupture of active thrusting in the foothills. There are a series of westward vergence thrust systems in the foothills of western Taiwan. Structural transfer zones act a bridge between these thrust systems from north to south. The previous studies have proposed characteristic structural geometry and the feature of the different thrust systems and the structural transfer zone between the thrust systems has been less addressed. The main purposes of this study are to reconstruct subsurface complex geometry of the structural transfer zone and to decipher how the different thrust systems are linked to each other in southwestern Taiwan. The formation the structural transfer zone and their evolutionary mode are further discussed. A series of balanced-cross sections, previously and newly built, and seismic tomography were used to reconstruct a 3D geometry of the zone and to reveal some along-strike changes in some characteristics of structure in this study.

On the surface, the structural features to the north of the study area are characterized by narrow-spaced thrusts in the inner part of the foothills, in contrast to the even- and wide-spaced thrusts to the south. 3D geometry shows that décollements of the thrust system become shallower and converge toward the structural transfer zone. On the northern side of the structural transfer zone, tear fault plays a role of the lateral ramp of the major thrust on its northern side and confines the thrust sheet translating along the thrust on its southern side. Because of the difference in the lithology on the northern side, which is characterized by more sandy layers, and southern side of the tear fault, an imbricate and a buried duplex fault system formed respectively. In addition, some out-of-sequence thrusts appear nearby the duplex structure.