



Research on Shallow Seismic Prospecting Method to Main Active Faults in Urumchi

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Urumchi locates in the east segment of North Tianshan Mountain tectonic belt and earthquake belt, and four crossing faults have developed with the intense tectonic movement in this area. In them Xishan Fault, Wanyaogou Fault, Yamalike Fault and Bagang—shihua Fault are the main urban active faults spread near to E—W .In Urumchi urban active detection in these two years ,we have completed lots of seismic surveying and study .Now we choose some typical and efficient seismic exploration materials to do some valuable research on seismic detecting method for surveying thrust fault with strike-slip component in Urumchi.

Its all known that to make urban active fault detection has vital actual significance for urban planning, earthquake resistance and reducing damages of urban facilities from earthquakes. The seismic prospecting of shallow high resolution is one the effective and reliable methods in urban active fault detection ,and may survey the location and buried depth, attitude and space distribution of active faults underground. We have abundant study achievements as to tectonic geology and activity of the above four faults, but lack badly the reliable tectonic materials in quarry deposit and noisy urban area .Therefore it is necessary to apply shallow seismic prospecting method to detect these faults in urban areas.

In this paper acquisition technique of high -resolution shallow seismic data and data processing methods are studied and the reflection abnormal characters of the faults revealed in chosen seismic profiles are expatiated on the base of concrete analysis and study of the shallow seismic materials in surveying the above active faults.

Though the research it is found that the reliable seismic results can be obtained which accord with the geological tectonic and the stratigraphic structure near to ground if proper observational system and digital acquisition instrument are used as well as the appliance of the canonical elaborate data processing. Furthermore in the process of making geological interpretation on seismic profiles we constructed corresponding fault movement tectonic models near to ground based on the distinctive reflection characteristics of fault abnormality with the reference of concerned geological materials. Otherwise the interpretation results offer audible and direct materials to confirm the fault property thrust stratum and the buried depth of the highest point of the hanging wall of the fault.

Finally it is testified that shallow seismic prospecting method has the ability to acquire the reflection signals with high resolution within 100 ms by the analysis of overseas and domestic some shallow seismic surveying examples.