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Depth Distribution and Preparation Background of Earthquakes in North China

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There are a few seismic belts in North China where earthquakes occurred frequently. They showed different features on depth distribution of middle and small earthquakes on different belts, which are, (1) earthquakes in seismic belts with NNE trending are deeper than that in those with NW or approximate EW trending; here it is strange that in Bohai bay, the deep focal depth below 40km reflects that the media in mantle here presents brittle property; (2) in the seismic belt in NNE trending, the focal depth at south section is larger than its north section, which may illustrate that the differential uplift is stronger at the south areas; (3) in the strong earthquake areas, the peak depth distribution is evidently deeper; (4) in strong earthquake areas exist low velocity layers and deep faults in middle or lower crust, where the spatial distribution of small earthquakes were consistent with trending, dipping of deep covered faults[1], which were always the seismogenic faults.

The movement of deep media affects the low velocity layer in mantle, and then sends the stress up to crust, to trigger the slip of deep faults, while the existence of low velocity layer and covered structures as the channel of upwelling media in deep crust provides the basic background for the stress accumulation of strong earthquakes. Therefore, the increase in focal depth may become an important precursory signal in analysis of stress field and strong earthquake prediction.

Keywords: depth distribution; earthquake preparation; deep fault; earthquake prediction

References

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