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Seismic Anisotropy in the crust in Capital Area in China

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Seismic anisotropy is obtained in the crust in northwestern Capital area in China by shear-wave splitting analysis, using the SAM technique. The seismic data was recorded at the Capital Area Seismic Network from Jan. 2002 to Dec. 2003. The results at 14 stations in all, every of which has at least 3 records available or more, are statistically discussed in this paper. The statistical results show that the average polarization of fast shear-waves is at NE69.9º$\pm$44.5º and the time delay of slow shear-waves is at 4.44$\pm$2.93 (ms/km). The average polarization of fast shear-waves of NE69.9º$\pm$44.5º suggests the direction of maximum horizontal principal compressive stress in this area. The most predominant polarization direction of fast shear-wave suggests the tectonic implication of horizontal principal compressive stress at the direction NWW or nearly E-to-W, which expose the Zhangjiakou-Penglai depression fault zones with strike NWW. According to the polarization of fast shear-wave, this study verifies that the predominant polarizations of fast shear-wave at stations on active faults are consistent with fault strike. Possibly, both the Nankou - Sunhe fault and Xiadian fault are two active faults while the Babaoshan fault is possibly a *non-active* active fault. The polarizations of fast shear-wave in the North China Basin show the complexity, consistent with the complicated pattern of regional principal compressive stress controlled locally, induced by many faults crossing in the depression zone within the basin. This study also suggests that the quick spatial change of time delays of slow shear-waves is possibly related to the temperature change in deep crust. Last, data from southeastern Capital area are also dealt for shear-wave splitting in the crust. A comprehensive analysis is given in this study. This study is supported by NSFC under Grant 40674021.