

Inversion of Slip Rates of The Faults around Ordos Block, Northern China, Based on GPS and Leveling Observations

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This article introduces a method to inverse the slip rates on the tilt faults, combining both GPS and leveling observations. Based on these observations of Ordos block from 1999 to 2007, we considered the influence of independent dislocation on the faults and the constrain of adjacent faults, and used the least squares method to inverse the slip rates of these faults, and compared them with those of other research group and tried to explain the difference. Then we discussed the influences of locking depths, dip angles and some other factors on the inversion and draw some conclusions. The inversion results show that (1) Mount Daqing Fault is left-lateral and normal. Its strike slip rate is $0.80 \pm 0.06 \text{ mm/a}$, and its dip slip rate is $1.86 \pm 0.28 \text{ mm/a}$. Mount Bayanwula, Lang and Se'erteng Fault is also left-lateral and normal, the average strike slip rate is $0.15 \pm 0.10 \text{ mm/a}$, dip slip rate is $1.20 \pm 0.60 \text{ mm/a}$. (2) Faults in Shanxi Rift are normal with weak right-lateral, the strike slip rate is in the range of $0.15\text{--}0.3 \text{ mm/a}$, and the dip slip rate is in the range of $0.6\text{--}1.3 \text{ mm/a}$. (3) Faults in the South Shanxi and Weihe Rift are complicated distributed. They are mostly right-lateral and normal faults. Some are primarily normal while others are primarily right-lateral. One of the important faults in this area, Mount Huo Fault, is right-lateral and normal, with a dip slip rate of $1.48 \pm 0.08 \text{ mm/a}$. Another important fault is the North Qinling Fault, which is also right-lateral and normal with a strike slip rate of $0.08 \pm 0.20 \text{ mm/a}$ and a dip slip rate of $2.26 \pm 0.35 \text{ mm/a}$. (4) Mount Liupan Fault on the Southeast of Ordos block is left-lateral and reverse. Its strike slip rate is $1.08 \pm 0.08 \text{ mm/a}$, and its dip slip rate is $1.30 \pm 0.06 \text{ mm/a}$.