

Using a Structure Correction Method to Improve the Location Accuracy of the Hotan Seismic Array

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A structure correction method is investigated and used to improve the location results of the Wenchuan, Pishan, and 171 other earthquakes using the Hotan seismic array data. Systematic slowness anomalies are found between frequency–wavenumber analysis and the location results from the China Earthquake Network Center, and all slowness error vectors point to about 300 degree. It is found that the back-azimuth and slowness errors change from positive to negative as the back-azimuth of different ray paths turns from north to south and from east to west, respectively. This phenomenon can be attributed to a dipping layer beneath the array with strike, dip, and velocity contrast of 210 degree, 45 degree, and 0.78, respectively. After correction for this dipping structure, the location results of the two main sequences are improved by 25.5% and 70.8% in terms of back-azimuth and slowness, respectively. Moreover, the location results of the other 171 earthquakes are improved by 28.5% and 7.1% in terms of back-azimuth and slowness, respectively.

Keywords: Hotan array, systematic error, dipping layer, location improvement