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山西地震带中小震精确位置及其显示的山西地震构造特征

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Relocation of small to moderate earthquakes in Shanxi Province and its relation to the seismogenic structures

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摘要

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摘要 利用山西1981—2001年模拟观测台网和2002—2008年间数字地震台网的震相数据,采用绝对定位方法和双差相对地震定位方法对山西及其周边地区中小地震进行了精确重新定位.结果表明:(1)重新精确定位后,震中水平误差 ≤ 5 km的地震由原来65.8%提高到86.2%;7498次原始无震源深度的地震取得了深度结果.(2)精确定位后震中分布格局与原始结果相比变化不大,绝大多数地震集中在中部断陷盆地内,两侧隆起区则相对较少,与山西地质构造的区域性和成带性相吻合;震源深度北浅南深,存在由北向南逐渐加深的特点.(3)重定位结果可以大致勾勒出各构造盆地发震层下界,较清晰地分辨出断陷盆地、盆间隆起的位置.(4)地震深度分布与盆山构造形态有较好的相关性.

关键词 山西地震带, 重新定位, 地震构造

Abstract: Based on the phase reports of analog seismic stations from 1981—2001, and those of digital seismographs from 2002—2008, we relocated the small to moderate earthquakes with unprecedented precision by absolute and relative relocating methods. Results show that: (1) comparing with precious researches, the percentage of relocated earthquakes with horizontal locating error ≤ 5 km increases from 65.8% to 86.2%, and 7498 earthquakes which were not located previously are located in this work; (2) The general pattern of seismicity has no big changes in horizontal directions. Most earthquakes occurred in the central rift belt, with a few earthquakes located at the two sides of the Fenhe-Weihe Rift. While in vertical direction, the relocated earthquakes have an obvious trend that the earthquake depths increase from north to south part of the Fenhe Rift. (3) The distribution of relocated earthquakes can outline the profile of the lower seismogenic boundaries of the basins, as well as the boundaries between the extensional basins and the uplifted areas. (4) There is a good correlation between the focal depths and the structures of the basin and range system.

Keywords Shanxi earthquake belt, Relocation, Seismogenic structure

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