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秦岭造山带与沉积盆地和结晶基底地震波场及动力学响应

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Seismic wave fields and dynamical response for Qinling orogen and sedimentary basins and crystalline basement

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摘要

秦岭—大别造山带横贯中国大陆中部，并将我国东部分为南北两部；即华北克拉通和扬子克拉通.在南、北相向运动力系驱动下构成了一个极为复杂的复合、叠加构造带、成矿带和地震活动带.同时导致了该地域异常变化的沉积建造和强烈起伏的结晶基底.然而对它们形成的地球物理边界场响应，岩相和结构的异常变化尚不清晰，特别对盆山之间的耦合响应更缺乏深层动力过程的理解.为此本文通过该区榆林—铜川—涪陵长1000 km剖面的地震探测和研究结果提出：（1）沉积建造厚度变化为4~10 km，结晶基底起伏强烈，幅度可达4~6 km；（2）一系列基底断裂将该区切割为南鄂尔多斯盆地和秦岭北缘前陆盆地、秦岭—大巴造山带和南缘前陆盆地与东北四川盆地，其中前陆盆地为秦岭北渭河盆地和秦岭南通江—万源盆地；（3）秦岭造山带是北部华北克拉通向南推挤、南部扬子克拉通向北推挤下隆升的陆内山体，并构筑了其南、北前陆盆地；（4）秦岭造山带的南、北边界并非是一条边界断层，而应是包括前陆盆地在内的组合界带；（5）秦岭与大巴弧形山系源于同一深部结晶基底，即同根生.这一系列的新认识对深化理解秦岭—大巴造山带形成的深层动力过程和演化机理及厘定扬子克拉通的真实北界具有极为重要的意义.

关键词 秦岭造山带, 地震波场, 沉积盆地, 结晶基底, 动力学响应

Abstract:

The Qinling-Dabie orogenic belt traverses the central part of Chinese continent, dividing the eastern part of China into a north and a south part, that is, the North China craton and the Yangtze craton. Driven by the opposite movement force system, the orogen turns into an extremely complex composite superimposed tectonic belt, metallogenic belt and seismic active zone. Meanwhile, the force system also conduced the anomalies of sedimentary formation and strongly undulating crystalline basement in the region. However, it is not clear what is the geophysical boundary field response, abnormal changes of lithofacies and structure, in particular, the deep understanding of the dynamic processes on the response of basin-mountain coupling. The seismic detection and research have been done along the profile of Yulin-Tongchuan-Fuling which is about 1000 km long. And geological interpretation to these features is made. The result shows that the variation in thickness of sedimentary formation is 4~10 km and the crystalline basement is with the intense undulations by 4~6 km. The study area was cut into the southern Ordos Basin, Qinling north foreland basin, Qinling-Daba orogenic belt, south foreland basin and northeast Sichuan basin by a series of basement faults; in addition, the foreland basin including the Weihe river basin north of Qinling and the Tongjiang-Wanyuan basin south of Qinling. Qinling orogenic belt, an intracontinental rising mountain , was formed by the North China Craton pushing towards south while the Yangtze craton squeezing towards north. And the process formed the southern and the northern foreland basin. The south and north boundary of Qinling orogenic belt is not a boundary fault but a combination boundary belt including the foreland basin. Qinling and Daba arc-shaped mountain originated from the same deep crystalline basement, that is to say, they were born from the same root. The series of new knowledge has significant implications for deeply comprehending the deep dynamic process and evolution mechanism of Qinling-Daba orogenic belt and redefinition

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of the true north boundary of Yangtze craton.

Keywords Qinling Orogen, Sedimentary, Basins, Seismic wave fields, Crystalline basement, Dynamical response

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