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Research on earthquake risk along the east boundary belts of the Sichuan-Yunnan Block

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The Sichuan-Yunnan Block surrounded by Jinshajiang-Honghe fault, Xianshuihe-Anninghe-Xiaojiang fault. The study of neotectonic movement, seismogeology and modern seismology shows that the Sichuan-Yunnan Block is mainly characterized by the southeast towards slip. The slip speed of every border fault zone of this block is quite different. It is considered that the movement status of the blocks, mutual interaction between the bloks and the depth of the border fault are the important reasons to cause the intraplate strong earthquakes. The grouped strong earthquakes distribution in history in main seismic structure belts are analyzed. A lot of earthquakes occurred along these fracture belts in historical records and in recent period.

Based on the space spread of the source rupture and fault property of source, it have been discussed the relation between earthquake activity and structure belt. According to our work results, future strong earthquake in Sichuan may occur in the seismic zones striking NS direction. Because strong earthquake took place in the seismic zones striking NE and NW direction in past two decades, such as Songpan earthquake in Songpan-longmenshan zone, Luhuo and Daofu earthquake in the north segment of Xianshuihe zone. However, no strong earthquake occurred in seismic zone striking SN direction, such as the Anlinghe zone, the south segment of Jingshajiang and Xianshuihe seismic zone. The black section of strong fracture along the fault zone were existed. Second reason is that we have obtained lots of data of horizontal and vertical displacements for some faults. The move rate is different in each segment of fault. It have been presented the phenomena of similar barrier in these segments such as Qianlin, Shimian, Xichang fault.

Using the wave recorded by Chengdu digital seismic net, we studied the focus parameters of the earthquakes in Sichuan province, such as radiated energy and apparent strain etc, and also studied the spatial distribution of the apparent strain of the earthquakes in Sichuan province recent years. By averaging the apparent strain values in definite space, we drew out the isolines of the apparent strain. The result indicate that the relative high apparent strain area is in the boundary between the Sichuan and Yunnan province, at the south of Sichuan province. Another high apparent strain area is in the boundary between the Sichuan and Gansu province, at the northern part of Sichuan province. Specially the relative high apparent strain area is in the east belts of the Sichuan-Yunnan Block.