



Present-day Focal Mechanisms and Stress Field of the Sichuan-Yunnan Active Block and Its Adjacent Region

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Focal mechanism solutions together with the depths of 66 M 3.5 moderate earthquakes occurred in the Sichuan Yunnan active block and its adjacent regions from Aug.1st, 2007 to Sep.15th, 2012 was obtained by CAP method. Furthermore, by combining the results with the focal mechanism solutions from Harvard University, we investigated the characteristics of the stress field in the study area. We discussed the spatial distribution of the focal mechanisms and the focal depths, and then analyzed its dynamics. Four conclusions are drawn as follows. (1) Focal mechanism solutions show zoning characteristic. Along the ANH-ZMH-XJ faults (the eastern border of Sichuan-Yunnan block), the earthquakes are mostly left-lateral strike-slip mechanism. Along the HSH fault, the earthquakes are mostly right-lateral strike-slip mechanism. Around the XGLL block and in its interior, there exists remarkable normal fault mechanism with different fault striking and direction of P and T stress axis. Along the arc boundary of Sichuan-Yunnan block with the Sichuan basin, the earthquakes are reverse fault mechanism. (2) The inverted regional stress field shows complicated local feature. On and to the east side of the eastern border of Sichuan-Yunnan block, the stress field is similar with the stress field of the Eastern China block, which is from the relative motion of Philippine plate towards the Urasia plate. Whereas to the west side of the eastern border of Sichuan-Yunnan block, the stress field is much more complicated, indicating the strong influence of local structures to the stress field, especially the NE striking of JPS-YL over-thrusting tectonic structure located in the interior of Sichuan-Yunnan block. (3) The moment center depths of events occurred in the Sichuan-Yunnan active block are within 15km deep, and mostly among 5~15km, suggesting that the brittle seismic layer is among the depth of 5~15km in the upper and middle crust.