Seismic Risk on the Northern Xiaojiang Fault Implied by the Latest and Nearest GPS Observations

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The Xiaojiang fault zone, part of the southeastern boundary fault zone of the Tibetan Plateau, exhibits high seismic activity due to its complex structure. On the basis of continuous and dense GPS observations covering the northern segment of the Xiaojiang fault zone (n-XJFZ) from March 2012 to March 2016, we present the velocity field, spatiotemporal deformation, slip rate and locking depth of the n-XJFZ. The results provide strong support for achieving a better understanding of the deformation behavior of this fault. The heterogeneity of the GPS velocity field and the relatively nonuniform distribution of seismicity suggest that the observational area is fragmented. Shear strain has been accumulating with an almost constant azimuth, which is consistent with the trends of mapped major faults. The 2014 *M*s 6.5 Ludian earthquake produced a sudden change in the dilatational strain, which was almost constant prior to the event. Despite the nonuniform deformation in the study area, the average strain rates of the whole study area and the northern and southern subareas all increased after the Ludian earthquake, revealing that the n-XJFZ is becoming more locked. These results imply that the seismic risk in the study area is currently rising and that, similar to the 2014 *M*s 6.5 Ludian earthquake, future earthquakes will possibly occur away from mapped faults.

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