



The implications of regional seismicity in Longmenshan fault zoneduring the 2008 Ms 8.0 Wenchuan earthquake

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The Ms 8.0 Wenchuan earthquake on May 12, 2008 may have significantly changed the regional seismicity pattern. In this study, we apply the Z-test statistical method to the seismic data from 2003 to 2013 to investigate changes of regional seismicity rates and their statistical significance in LFZ and its neighboring regions. Our primary results show that, due to the 2008 Wenchuan earthquake, seismicity rates have significantly increased in Eastern Kunlun fault, southern Longmenshan fault, Longquanshan fault and Huayingshan fault in Sichuan basin, but have significantly decreased in northern and central Longmenshan fault, vicinity of the Songpan-Minjiang fault, and Fubianhe fault in Bayankala block. We analyze changes of the Z value with respect to time and seismic magnitude in each region, and find that small seismic events ($<M_s 3.0$) are more appropriate to be used for analyzing changes of seismicity rates than large events. Our results confirm predictions of Coulomb failure stress changes for most regions and fault zones, revealing that our current statistical method applied to seismic data is reliable and efficient for analyzing seismicity rate changes after a big earthquake. Statistical analysis of seismic data can be combined together to evaluate regional seismicity and future earthquake hazards and its mitigation.