



The 2017 Mw6.5 Mainling earthquake in Tibet and its seismogenic structure

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The Eastern Himalayan syntaxis (EHS) has two high peaks (Namche Barwa and Gala Bailei) above 7200 meters and the Yalu Tsangpo River pass between them. The Yalu Tsangpo suture is right there. It is an important region for studying the dynamics of continental collision. The 2017 Mw6.5 Mainling earthquake in the area is captured by the Namche Barwa Virtual Seismic Network (NBVSN) which was set up in Dec. 2016, so the aftershocks are perfectly recorded. The distribution of the aftershocks shows that the strike of the earthquake almost parallel to the line of Gala Bailei and Nangabawa peaks, and that the depths are from 2km to 20km. The aftershocks is sharply stop at Mailing Fault in northwest and Yalu Tsangpo River and Palong Tsangpo River in the northeast. There is a separatrix in NE profile of the hypocenters, which reveals a SW-dipping fault with dip angles about 30 degree. The focal mechanisms of the main-shock shows a thrust source locating at the depth of 15 km, and is a thrust fault with SE-NW strike, dip SW, and dip angles about 30°. Meanwhile the focal mechanisms of 8 moderate aftershocks correlate well with the focal mechanism solutions. The fine relocation of the aftershocks shows that apart from the seismogenic fault of Mainling earthquake, another two NNW-trending faults were activated and that seismicities on the adjunct faults were triggered by the Mainling main-shock. The time-varying image of aftershock epicenters demonstrates that there are three faults almost parallel and that the aftershock sequence extended from west to east. From the tomographies of P and S, there is an incline changes in E-W velocity profile.