



Stress and structure analysis of the Seismic Gap between the Wenchuan and Lushan Earthquakes

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An array of 20 short-period and 15 broadband seismometers were deployed to monitor the seismic gap between the 2008 Ms8.0 Wenchuan earthquake and the 2013 Ms7.0 Lushan earthquake. The Wenchuan earthquake ruptured from epicenter at (31.01°N, 103.42°E) largely northeastward while the Lushan earthquake ruptured from epicenter at (30.3°N, 103.0°E) largely southwestward. The region between the two earthquakes has recorded very few aftershocks and cataloged seismicity before and after the two big earthquakes compared to neighboring segments. As one small segment of the 500KM long Longmen Shan fault system, its absence of seismicity draws hot debate on whether a big one is still in brewing or steady creeping is in control of the strain energy release. The dense array is deployed primarily aimed to detect events that are much smaller than cataloged events and to determine if the segment is experiencing constantly creeping. The preliminary findings include: (1) source mechanisms show that the seismic gap appears to be a transitional zone between north and south segment. The events to the south are primarily thrust while events to north have more or less striking-slip components. This is also the case for both Lushan and Wenchuan earthquake; (2) The receiver function analysis shows that the Moho beneath the seismic Gap is less defined than its adjacent region with relatively weaker Ps conversion phases; (3) Both receiver function and ambient noise tomography show that the velocities in the upper crust is relatively lower in the Gap region than surrounding regions; (4) significant number of small earthquakes are located near surface in the gap region. Further examinations should be conducted before we can make a sounding conclusion on what mechanism is in control of the seismicity in this region.