



## **The stress evolution and seismicity before Lushan earthquake in Longmenshan area since 1900**

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**Abstract:** Strong Earthquake can disturb regional stress field. The variation of static Coulomb stress induced by the rupture process of earthquake can explain the distribution of aftershocks, the earthquake sequence and other seismic observation results. In addition, the coseismic coulomb stress is only a part of the stress evolution process, the interseismic effects include the viscous relaxation and variation of stress induced by other earthquakes should also be considered. There are four earthquakes which magnitude exceed 7.0 occurred in The Longmenshan area before Lushan earthquake since 1900. Study on how these Four earthquakes influent Lushan earthquake, how the stress on the faults change accompanied with strong earthquakes that may provide some basis for future seismic risk assessment in this region. In this paper, we construct a 3D finite element model which include the geological structure, inhomogeneous medium, the GPS and the stress observation data as boundary condition and constraint condition to do the research. The simulation results show the coseismic Coulomb stress which induced by Kangding, Songpan, Wenchuan earthquake at Lushan earthquake epicenter is greater than 0 Mpa, , especially the value of Wenchuan earthquake exceed 0.01Mpa, in addition, the tectonic stress at epicenter of Lushan earthquake is continuous loading ,which means the extrusion from the Tibetan Plateau has a cumulative effect at this location. We also compare the distribution of historical earthquakes with the stress filed. Almost 70% earthquakes located in stress enhanced area whatever from effective stress or coulomb stress result. The stress evolution of faults in this region which considering influence by other earthquake and interseismic change was also given.