Abstract Details

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Title: (IWG3B)GPS MEASURED CRUSTAL DEFORMATION OF THE Ms8.1 KUNLUN EARTHQUAKE ON NOVEMBER 14th 2001 IN TIBETAN PLATEAU

Abstract:

On November 14th 2001 a large earthquake with magnitude of 8.1 occurred at northern Tibetan plateau in China. The earthquake has created a surface rupture with a length of 426km long, which is the longest surface rupture in China caused by an earthquake. The rupture is developed along the eastern Kunlun fault that has been active during the Quaternary. The fault movement along the surface rupture was left-lateral with about 6m of maximum horizontal displacement and the maximum vertical displacement is about 4m. The surface rupture can be divided into four segments, each represented a sub event that occurred almost at the same time. This may explain the huge length of the surface rupture. SPOT satellite images were used to map the surface rupture traces and it turned out to be the most efficient way to do mapping work in such a desolate area. 58 GPS stations around the surface rupture and the surrounding areas have been reoccupied after the earthquake. Among these GPS stations about 10 of them were measured 10 years ago, and the rest of them were measured during the last couple of years before the earthquake. Another 16 GPS stations across the surface rupture were also established immediately after the earthquake, among them 4 has been continuously observed and the rest of them have measured four times since November 17th 2001. The preliminary result from the GPS observations has shown that the displacements across the rupture decreased from 50cm at 200km away from the rupture to about 10cm at 400km away from the rupture, showing the rheological property of the deformed crust in the plateau. The post-seismic creeping rate across the fault is decreasing with time. The results from the GPS observation analysis are very much alike to that of surface geological results.

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