Geophysical Research Abstracts
Vol. 16, EGU2014-13669, 2014
EGU General Assembly 2014


# Contemporary surface ruptures in the zone of the Baikal-Mondy fault (Baikal rift system): dynamics of formation and origin

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Sublatitudinal Baikal-Mondy (Tunka) left-lateral strike-slip fault accommodates North Mongolia submeridional rift basins opening (Darkhad and Khubsugul). It is the connecting link between the central and south-western parts of the Baikal rift system. We investigated the present-day activity of faulting on southern border of Mondy basin, which is due to their position at the junction of east-west trending active faults of the Baikal-Mondy fault system with submeridional structures of Khubsugul basin. The investigated area is characterized by high seismic activity. The epicenter of one of the strongest Mondy earthquake 1950 (Mw = 7.0) is located within the Mondy basin. Reconstruction of Late Cenozoic tectonic stress field shows a predominance of strike-slip deformation regime with NW-SE direction of the minimum compression axis and NE-SW direction of the maximum compression axis, which correlates with the present-day stress field derived from the data on earthquake focal mechanisms.

On the top of the southern shoulder of Mondy basin a series of extended NE trending surface ruptures that cut the crust of weathering and bedrock across the local watershed were discovered. The rupture length reaches 180 m, width ruptures bedrock reaches 0.6 m. In the bedrock tectonic microfractures of NW and NE directions are dominated, but the NW trending surface ruptures are not observed.

In the area of contemporary ruptures the geodetic measurements were carried out in the period 2009-2013. The results of processing the measurement data on the local testing ground showed that most divergent baselines undergoes extension with maximum values reaching 30 mm/year. The block experienced elongation in all directions, but the morphology of ruptures suggests that the main direction of stretching is NW-SE. The intensity of cracks opening decreases markedly with time. According to eyewitnesses known that active crack opening at about 100 mm/year started 4 years before Kultuk earthquake (27.08.2008, Mw = 6.3), the epicenter of which was located near the southern tip of the Baikal basin.

The existence of centimeter level deformations is confirmed using of differential SAR interferometry method. A pair of images taken with an interval of 2 years highlighted the linear zone of active deformation in the centimeter level. The length of the structure is about 4 kilometers. The offset along the Line-of-Sight (LOS) direction is from 18 to 42 mm, which corresponds to the vertical displacement of 22 to 50 mm, or a horizontal displacement of 32 to 74 mm (Lebedeva et al., 2013).

Along with the described ruptures we discovered normal faults with an amplitude greater than 2 m, which can be traced along the submeridional local watershed. The length of the normal faults reaches 800 m. The morphology and position of these faults can be attributed to their sackung structures.

We conclude that the detected current surface ruptures have complex origins and develop under the influence of endogenous (tectonic) and exogenous forces. They founded along NE trending ancient tectonic structures within wide strike-slip zone and main direction of opening corresponds to the direction of extension of paleo- and present-day stress field. According to the dynamics of ruptures opening, the main phase of their formation is connected with stage of Kultuk earthquake preparation. As for geodetic data the block is stretched in all directions, it can be assumed that, by analogy with closely spaced sacking structures the gravitational collapse of rift shoulder uplift plays important role in the formation of surface ruptures.

RFBR project 13-05-01097.