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Late Cenozoic faulting and tectonic stress state on transition zone from rift to strike-slip structures (North Mongolia)

Vladimir SANKOV and Anna PARFEEVETS

Institute of the Earth's Crust of SB RAS, Recent Geodynamics and Geophysics, Irkutsk, Russian Federation (sankov@crust.irk.ru)

The faulting and Late Cenozoic crustal stress state on transition zone between Baikal rift system and strike-slip structures in North Mongolia are investigated. Submeridional Khubsugul, Darkhat and Busingol basins are characterized by normal fault setting at initial stage (Late Miocene – Pliocene) with NW-SE orientation of extension axis. The stress state has changed in Pleistocene about 500-400 kyr ago. The strike-slip regimes with NW-SE extension axes and NE-SW to NNE-SSW compression axes are dominated at present-day stage. At the same time the evolution of sedimentation conditions has occurred.

The sublatitudinal Erkhilnur and Muren basins within transition zone are demonstrated strike-slip fault paragenesis and combination of strike-slip, extension and transpression stress regimes in the fault zones of different orientations. In general NW-SE extension axes and NE-SW compression axes are typical for these structures. The spatial changes of stress regimes from transpression to transtension conditions along the North-Khangay fault zone are revealed. The fault parallel thrusts one can see on the western fault segment, while the eastern segment exhibits the releasing bands structures with coulisses like half grabens system. The oldest deposits within transition zone basins have Pliocene age.

It is shown that the strain transfer from North Khangay strike-slip zone to rift basins realizes through Erzin-Agardag and Tsaganuul strike-slip faults. The last two faults are conjugated with rift structures via NW-SE trending mounting spurs. The origin of the North Mongolia rift basins formation, possibly excepting Busingol basin, was independent on the strike-slip movements along North Khangay fault zone. The inset of NE collision compression has intensified the basin sagging because of its favorable orientation. The following expansion of the compression deformation front to the edge of rigid Siberian craton was the reason of temporal evolution of tectonic stress regime and basin inversion initiation.