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Recent state of stress and strain of the West Mongolia and Tuva

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The investigation of the crustal state of stress and strain in the peripheral parts of the India-Asia collision zone may be of interest in terms of origin of neotectonic structures in the inner parts of the continents and their high seismic hazard. Five earthquakes with magnitudes more than 7.5 occurred in the region over the last 100 years.

Paleostress has been reconstructed for active fault zones of the West Mongolia and Tuva by inversion of the fault slip data. The results have shown the prevalence of strike-slip, transpression and compression stress-tensors with the maximum compression axis of the NE or N-S strike. The results of computations of present-day stress-tensors by inversion of earthquake focal mechanisms have indicated close resemblance between the paleo- and recent state of stress.

The measurements made using GPS-geodesy technique and computations of the components of seismotectonic deformations in focal zones of the largest earthquakes with $M>7.5$ have yielded the estimates of a long-term components of the rate of horizontal crustal deformations of the West Mongolia. The rates of horizontal deformations are comparable both in direction of the contraction and elongation axes and in values (up to the first tens of nstrain/yr). In accordance with the GPS-geodesy data, the maximum deformations are concentrated along the periphery of the Mongolian block. The NE strike is dominated by horizontal contraction. The rates of deformations are relatively low in the central part of the block (Khangai dome) and vary along directions of the contraction and elongation axes.

It has been concluded that neotectonic structures along the periphery of the Mongolian block, at least from the Pliocene to the present day, develop in the uniform stress field under the influence of the NE compression produced by the India-Asia collision.

Kinematics of the major active faults (Bolnai, Bogd, Kobdinsky and others) is inseparably connected with an acting tectonic stress field. The variety of orientations of the stress and strain axes of the Khangai dome and formation of variously oriented normal faults are due to the interaction between extension resulting from the mantle anomaly influence and NE regional compression.

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