Formation of Cenozoic relief in the folded regions of Central and Southeast Asia. Mathematical modelling

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The study of the formation conditions of the Cenozoic relief in the folded regions of Central and Southeast Asia is an urgent task to be solved on the basis of geological, geophysical, geodetic, tectonophysical, and other methods. Mathematical modeling allows one to supplement existing instrumental observations and test various physical hypotheses about the structure, physicomechanical properties of the blocks, as well as loading conditions leading to specific tectonic flows and the propagation of collision impulses on the active edges of the tectonic plates. In this work, structural and physical models are constructed that describe the propagation of deformation from the region of the Indo-Eurasian collision deep into the continent over long distances. Based on the scheme proposed in [1,2].

The main unsolved problem of the structural model in depth is that it, based on known data on the size and density of structural elements, does not fully meet the principle of isostasy due to the coarseness of these data, which reveal the calculations.

The physical model of the loaded geomedia takes into account internal friction, dilatancy, and the dependence of strength on depth. Since the estimates of all parameters of the model, taking into account the above factors, are very approximate, the resulting picture of the evolution of the Moho boundary, the change in the relief of the surface, as well as the emerging localized shear bands and faults at this stage differ significantly from observations.

Previous calculations of tectonic flows as well as calculations at the present stage showed that the main deformations are concentrated in the Himalayan region, near the indenter, although the directions of tectonic flows of Central and Southeast Asia are in good agreement with observations. The misfit is due to lack of gravity force in film formulation.

Considering tectonic flows in Central and Southeast Asia in the formulation of plane deformation is rough approximation. It is necessary to solve a full three-dimensional problem, where the presence of an additional degree of freedom will allow to take into account the most important factors: gravity, lateral spreading, structure, the effect of plumes, which should bring the model as close as possible to reality.

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