MECHANICAL-MATHEMATICAL SIMULATION OF GEOLOGICAL STRUCTURES EVOLUTION.

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For simulation of geological structures evolution the thermomechanical and mechanical-mathematical models of different rheology were used. The next problems were considered: forming and evolution of sedimentary basins, geothermal evolution of sedimentary cover, interaction of changeable sedimentary cover with crust and mantle lithosphere, reconstruction of deep mantle motions by movements of basement surface, simulation of back-arc spreading, geodynamics of collision zones of lithospheric plates, geodynamics of rifts, P-T parameters distribution in sedimentary cover, crust and mantle lithosphere. The results of modelling were considered on the examples of Pre-Caspian depression, sedimentary basins of Brazil and geological structures of Alpine and Pacific belts. The main results of modelling were: 1. Deep depression can arise above upwelling mantle diapir under some relationships between parameters of the model. 2. Surface grad T depends on structure evolution history and thickness of the lithosphere layers. 3. Continental crust is involved and sinks in the subduction zone during the collision process. 4. Form of downwelling plate in subduction zone depends on correlation between densities and viscosities of lithosphere plates and asthenosphere. 5. It is possible to evaluate the lithosphere thickness and the mantle diapir upwelling by original gravity-geothermal model.The results of modelling give good agreement with geological-geophysical data.