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Structure and Seismicity of a convergence zone between North and South Caucasian microplates: Eastern Caucasus - Caspian megadepression (Azerbaijan)

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Transition area of Eastern Caucasus - Caspian Megadepression corresponds to a periclinal submergence zone of the mountain folded structure of the Greater Caucasus under Pliocene-Holocenic sedimentary complex of Caspian megabasin. Being a part of Alpine-Himalayan folded belt, Greater Caucasus has formed during alpine stage of tectogenesis under geodynamic conditions of convergent interactions between Northern and Southern Caucasus continental microplates. This process has been accompanied by pseudosubduction of the first plate under the second with formation of allochtonous accretion prism above underthrust zone. Modern folding and napping structure of the orogeny has formed as a result of the horizontal movements of different phases and subphases of alpine tectogenesis, that are presented represented by Late Cimmerian - Wallachian tectonic phases within Azerbaijan territory.

Limited by meridional fault-slip zones, Caspian megadepression present itself as a young structure that layered on sublatitudinal convergent zone and developed during Late Miocene (10 million years ago) as a flexure zone between two indenters which actively move northwards provoking their separation from the African continent and Arabian plate in the west and secession from Central Iranian plate of the Lut block in the east.

The acting movement of Arabian plate to the north supports the accumulation of the horizontal stress at the current stage of tectogenesis. Current process reveals itself both in the fragmentation of Southern and Northern Caucasus continental microplates into various-size blocks along the general and anti-Caucasus trended faults, and in consideration horizontal and vertical movements within the convergence zone. All these factors define the complexity of geodynamic condition revealed here, in which recent seismic activity of a transition zone become apparent. There exist the seismic zones here that are confined both to a convergence line and to the fault zones that confine Caspian megadepression or complicate its' inner structure.

Under lateral compression conditions, the small-size dynamic blocks that form the inner structure of the earth crust in a transition zone is standing as a reason of formation of the transpressive deformations, which combine moving along bordering of transversal dislocations with the compression structures like Main Caucasus strike faults in a trend of convergent (pseudosubduction) interaction of Southern and Northern Caucasus continental microplates.During such regime a multiple elastic stress accumulation zones are developing, that are confined to mentioned dislocations and their connection knots. Namely, exceeding of a breaking point of the rocks by accumulated elastic deformations bring to energy release and fragile destructions (stick-slip mechanism) in such tectonically vulnerable transition zones.