Tectonic Styles of the South Caspian Basin According to The New Geological and Geophysical Data

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Abstract:

The South Caspian basin is an aseismic 'block' within the Arabia – Eurasia collision zone which moves relative to both Iran and Eurasia. The basin contains one of the thickest and most rapidly accumulated sedimentary sequences exceeding 20 km overlying a basement of possible back-arc basin. To understand the evolution of the South Caspian basin, a model of tectonic motion of the basin has been developed. The model integrates results of subsurface interpretations within the basin with field-based and remote sensing studies of active tectonics. The study examines the timing and styles of deformation in basin interior and along its margins. The results of study suggest that previous tectonic phases in Oligocene – Miocene left their traces and the presently active tectonics of the South Caspian basin began abruptly at 1.8 Ma. The tectonic history of the South Caspian basin includes northward subduction until 6 Ma, followed by rapid oroclinal bending and plateau growth in the ranges surrounding the basin until 1.8 Ma. The structures within the basin evidence this tectonic history. Several domains of folding and faulting have been identified within the basin that are related to "thick skinned" faulting, according to their wavelength and asymmetry, as opposed to the "thin-skinned" deformation observed in the deep part of the basin, which is more likely related to motion within the mobile Oligocene-Lower Miocene Maykop deposits. The results of the study refine our understanding of the present-day kinematics of the South Caspian basin, and of the factors that cause an evolution in the tectonic configuration through time.

Keywords:

South Caspian basin, tectonics, fault, model.