

EVOLUTION OF THE SOUTH CASPIAN BASIN – EVIDENCE FROM OFFSHORE SEISMIC AND ONSHORE ACTIVE TECTONICS

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The South Caspian Basin is a deep-water basin containing one of the thickest accumulated sedimentary sequences on earth, with up to 25 km of sediments, overlying thin oceanic crust.

To understand the nature of South Caspian Basin we build model of the tectonic motion of the South Caspian Basin, an enigmatic aseismic ‘block’ within the Arabia-Eurasia collision, which moves relative to both Iran and Eurasia. We combine published geologic and geodetic studies, field-based and remote-sensing study of active faults, and the interpretation of offshore seismic reflection data in the central and southern Caspian to examine the timings and styles of deformation in its interior and along its margins. We show that the presently active tectonics of the South Caspian began abruptly at 1.8 Myr. In the east and west this onset involved a change from shortening to oblique lateral slip, and along the northern margin (the Absheron sill) it involved the oblique strike-slip and shortening reactivation of structures that had been quiescent since 6 Myr. The tectonic history of the South Caspian Basin is hence one of northward subduction until 6 Ma, followed by rapid oroclinal bending and plateau growth in the ranges surrounding the basin until 1.8 Myr. At that time the basin began to be expelled to the northwest, with underthrusting and incipient subduction beneath the Kura basin along its western margin. The various short-lived stages in the destruction of the South Caspian give insight into the late-stages of oceanic closure and the transition to continental collision.

Different styles in the offshore sector separate Caspian into several structural domains: Absheron domain of subduction tectonics, West Kura domain of strike-slip and deep basin interior (fast subsidence). We interpret the west Kura domain as linking northwards to onshore to lateral strike-slip faults within the Kura basin.