

Basin modeling of south-western part of Precaspian basin

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Precaspian Basin is one of the greatest sedimentary basin of Eastern Europe and probably deepest basin in the world. Geology of basin is well investigated by seismic surveys, recently several deep wells provide good basis for stratigraphical dating of seismic horizons. Geological history of the basin favors formation of great hydrocarbon accumulations.

We carry out 1D, 2D and 3D modelling of the burial history, thermal history and hydrocarbon generation history was done for south-western part of Precaspian Basin basin using “Sedim” software package (Geological faculty, Moscow State University). Burial history restoration based on structural maps, lithological maps, pre-Jurassic erosion map and paleobathymetric reconstructions for Carboniferous, Permian and Paleocene time. Thermal model was calibrated by vitrinite reflectance data, present-day temperature measurements in wells and requirements of consistency between backstripped tectonic subsidence and thermal tectonic subsidence. Major source rocks of the region: Middle and Late Devonian, Early and Middle Carboniferous, were subject of petroleum generation modelling. Hydrocarbon generation in the region continued from Late Devonian till recent time, but was localised in different areas. Main oil kitchens in the region are located in Precaspian basin, in Karpinsky swell area, South-Emba area and in Terek-Caspian basin. Petroleum migration paths and accumulations locuse were computed through the whole geological history for main reservoirs: Middle Devoinian, Late Devonian, Frasnian, Carboniferous and Early Permian.