



## **Hydrocarbon Potential of the Offshore Akçakoca Region: Mud Volcano, Gas Hydrate and Shallow Gas Indications on Acoustic Data**

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The Black Sea is a large marginal sea located within complex folded chains of the Alpine system, represented by the Balkanides-Pontides belt to the south, and by the Caucasus and Crimea Mountains to the north and northwest. The Black Sea sediments are rich in calcite and organic carbon, the latter showing a high degree of preservation due to anoxia in the waters below 100-150 m. The Black Sea is one of the richest waters having immense gas and gas hydrate accumulations. Shelf and slopes with high sedimentation rates is considered as methane sources and gas seeps are observed around the basin. The study area is located offshore Akçakoca gas well which produces dry gas of 570.000 m<sup>3</sup>/day from reverse-fault anticline reservoir of Eocene age. The area also has the Kozlu structure far offshore, which has gas accumulations, gas chimneys and possible mud volcanoes. In 2012, a total of 1150 km high resolution multichannel seismic reflection (MCS), very high resolution Chirp sub-bottom profiler and multibeam bathymetry datasets were collected offshore of Akçakoca and Zonguldak in the Western Black Sea continental slope. The dataset were combined with the acoustic data from R/V Poseidon cruise in 2004 which included multibeam bathymetry, deep-towed side scan sonar and gravity coring on the Kozlu High. Bathymetric data shows that the shelf break is located at approx. 120 m water depths and continental slope extends between 120 to 1800 m water depths including 30 degree of maximum dip. In addition, continental slope is dissected by several canyons and canyon systems with smaller scale gullies. Preliminary analysis of the seismic data shows the shallow gas anomalies of the continental rise area and a mud volcano offshore of Akçakoca has been discovered at approx. 1490 m water depth. Diameter of the new discovered mud volcano is approx. 250 m. The southern part of the mud volcano has several gas chimneys reaching to the seabed, which are possibly actively degassing. Gas plumes were clearly observed in the side scan sonar data and they are mostly located above acoustic turbidity zones closely to offshore Akçakoca. We also observed a distinct Bottom Simulating Reflector (BSR) reflection below this seepage area lying at about 230 ms below the seabed. The seismic data also show several different mass wasting structures especially on the steep continental slope.