

DEEP STRUCTURE OF THE BLACK SEA CENTRAL RIDGE, (OFFSHORE TURKEY) IMAGED BY MULTICHANNEL SEISMIC EXPERIMENT

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During a short seismic cruise in February 1996, 100 km of multichannel seismic reflection profiles were acquired across the Black Sea Central Ridge, north of Sinop (offshore Turkey), in cooperation with ITU, MTA and TUBITAK, and the onboard participation of Turkish Petroleum. This offshore experiment was combined and coordinated with land based seismic recording managed by TUBITAK. Six lines cross cutting the ridge were recorded at 5 knots using a 2.4 km streamer. The source was a device of 14 airguns capitalizing 3000 cubic inches, all immersed at 20m depth. Sampling was 4m and 18s on the 9 traces of the streamer. Shots were 20 seconds spaced.

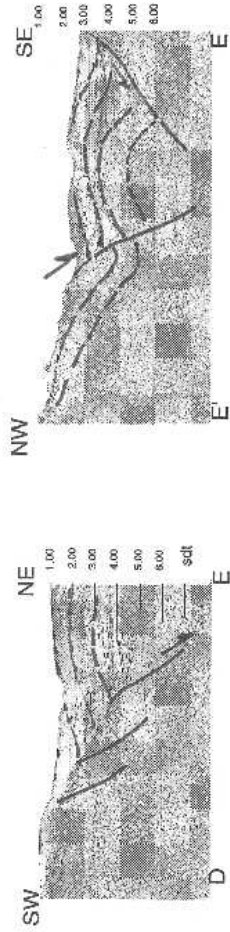
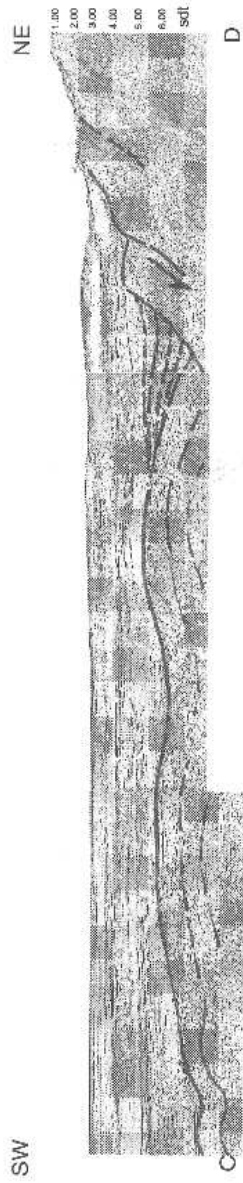
Preliminary stacks were realized onboard and further processing was conducted in our laboratory in Paris using C.G.G. GEOVECTEUR software and in ITU. Filtering, post- and pre-stack migrations were conducted with the objective to eliminate the multiples and to tentatively image the internal structure of the central ridge. Wide angle seismic data collected by TUBITAK are in the process to be combined with these seismic reflection data.

NE of the Central Ridge, over 5 sdt post rift sediments were deposited on the ridge flank. The deepest identified horizon is folded at the contact with the ridge, and a buried SW dipping reflector was identified at the foot of the ridge and interpreted as a possible NE verging thrust. This deformation increases toward the SE, where deformation is active and the whole post rift sequence was tectonically inverted. NE verging active reverse faults were identified in these sediments.

The structure of the ridge is formed by a series of NW-SE trending anticlines and synclines blanketed by 2 to 3 sdt undeformed sediments. No clear internal structures could have been identified in this folds; however, strong discontinuous reflectors suggests the presence of carbonates build-ups in the core of the ridge. A series of similar folds are known inland in the Sinop area where this deformation is considered as Eocene in age.

The Central Ridge is separated from mainland Turkey by a narrow NW-SE trending depression, the Sinop Trough. A transparent seismic sequence filled the trough and was deposited unconformably on top of the folded sequence of the Central Ridge. Active or recent normal faulting affects the edges of the Sinop Trough and roll back folding is located associated with these active normal faults. In a preliminary way, we interpret the Sinop Trough as an graben probably linked to the right lateral strike slip motion of the North Anatolian fault inland. This trough could represent a subsidiary transtensional branch of this major fault.

The folded core of the Central Ridge, downfaulted to the NE, could be interpreted as the offshore extension of the inland Sinop fold belt. To the NE, the tectonic relationships between the folded central Ridge and the NE deep Black Sea Basin is difficult to image on the seismic lines but could be a NE verging thrust. Finally the most active structure is the clear inversion of the whole package of sediments of this basin along the Pontides coasts. This active thrust could be interpreted as the westernmost extension of the Lesser Caucasus deformation front exposed in easternmost Turkey, but also in Georgia.



BLACKSIS CRUISE
Seismic profiles

