

MULTI CHANNEL HIGH RESOLUTION SEISMIC REFLECTION SURVEY IN SIGACIK GULF (IZMIR) AND SURROUNDING REGIONS: FIRST OBSERVATIONS

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Abstract

High resolution seismic reflection data were collected onboard R/V K. Piri Reis, research vessel of Dokuz Eylül University, in Sigacik Gulf (Seferihisar-Izmir) and surrounding regions in August-2005. On 17 October 2005, a series of earthquakes occurred in the same area just two months after the cruise. Seismic cross-sections indicate fault zones which probably caused earthquake series.

Keywords : Aegean Sea, Seismics, Tectonics.

Introduction

Sigacik Gulf (Izmir) and surroundings have significant seismic activities. There are few articles about the area that illustrate the tectonic activity in the bay.

Previous Multi-channel seismic reflection study shows that Izmir Gulf and surrounding regions are widely deformed by N-S to NE-SW trending active transpressional strike-slip faults, reverse faults and some E-W normal faults. Normal faults are cut by strike-slip faults [1], [2].

The study area and surrounding regions are under the effects of seismic activity. This seismic activity is concerned under Western Anatolia and general Aegean tectonic regime. The seismic activity seen in the region continues as earthquake series. These earthquake series are earthquake forms which are usually observed at fault zones that have lots of minor faults and also such forms were observed in different regions in our country in past years. Earthquake series can continue for days and months at such fault zones [3].

Seismic data acquisition and processing

During the sea trial survey, approximately 370 km of multi-channel seismic reflection data were acquired in August-2005 (Fig. 1). To produce and collect the seismic data the GI Gun (Generator-Injector Air gun) and 48 channel digital seismic streamer were used, respectively. Data processing flow was applied as follows:

Data load, geometry load, band pass filter, water bottom time pick, water bottom top mute, bottom mute, true amplitude recovery, decon before stack, stack, velocity analysis, radon velocity filter, time migration. The multiples due to the shallow seafloor and basement reflector were eliminated as much as possible by radon velocity filter techniques.

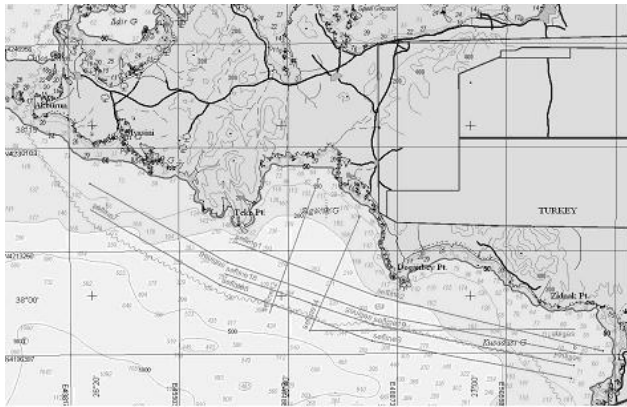


Fig. 1. The study area and seismic profiles.

Conclusions

The seismic data were collected during a sea trial survey, just two months before the Sigacik earthquake series which occurred between 17 and 21 October 2005. The epicenters of the earthquake series present at the same area with our seismic profiles. The Miocene age basement can easily be determined on seismic sections and the basement outcrops to the sea bottom. Earthquake series probably occurred on shear zone. One of the most important strike-slip faults occurred by means of this shear zone is the Tuzla Fault Zone and the component of this fault zone can be seen on

seismic sections. Multibeam Echosounder Survey and Side Scan Survey have been planned to make a detailed map of active faults.

References

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