



## Geophysical surveys around the Izmir Bay

Tunçel Aykut, Gönenç Tolga, Akgün Mustafa, Pamukcu Oya, Özdağ Özkan, and Çetiner Mehmet  
Dokuz Eylul University Engineering Faculty Department of Geophysical Engineering Buca-Izmir, Turkey  
(aykut.tuncel@deu.edu.tr)

Izmir is the 3rd largest city of Turkey following Istanbul and Ankara in terms of population, industrial density and contribution to the national economy. Izmir city is located very close to the active faults, has very high seismic risk and develops rapidly on thick and Quaternary-Neogene aged young sediments. Three different tectonic belts take place in Izmir precincts. One of these belts which shapes the Menderes massif at east consists of very thick mica schist unit at basement and a marble stack which formed by the metamorphism of the platform type carbonates. Another tectonic belt named "Izmir-Ankara zone" take place at western part of massif and around Izmir city there is another tectonic belt which is generally flysch characterized. "Karaburun Belt" is at west of "Izmir-Ankara zone" comprised by a thick Mesozoic carbonate stack which precipitated at platform conditions.

Izmir and its surroundings, has been the scene of intense earthquake activity since the historical period. The most of earthquake epicenters are at Aegean Sea and take place between Karaburun-Chios Island, Izmir Bay-Lesbos Island and Doğanbey Cape-Samos Island. A number of earthquakes occurs on the remaining land mass between the Aegean Sea and the western part of the Gediz graben. Izmir city to be the center of the 50-60 km radius, there are active faults that may pose a risk by generating potential earthquakes for Izmir metropolitan area and its surroundings.

Propagation of earthquake waves towards to surface can be affected considerably by unconsolidated soil structures of Izmir. While occurrence of shallow and large scaled earthquakes, mechanism of soil amplification, liquefaction in sandy soils and losses of bearing capacity in clayey soil can be expected that they are particularly effective on earthquake performance of both buildings and industrial areas. Also some conditions such as; physical parameters of alluvial soil, high groundwater level and basin geometry, which cause soil amplification, can be expected that will cause negative effect on behavior of constructions during earthquake.

In this context, in order to investigate the actual size of the danger which can be caused by soil deformations according to ground motion, TUBITAK projects were generated at Izmir and its vicinity. Goals of the projects were defined as investigating the bedrock, highlighting of dynamic parameters of soil structures and determination of basin geometry. In accordance with these objectives, geophysical surveys funded by TUBITAK were implemented. In this study, seven areas of Izmir where geophysical surveys were conducted will be presented.

### ACKNOWLEDGMENTS

This study has been achieved under the scope of The Scientific and Technological Research Council of Turkey (TUBITAK) projects (106G159 and 108Y285).

Key words: Izmir soil, microgravity, microtremor, MASW, SPAC