Determination of Current Seismotectonic Properties of Denizli and Its Region

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Denizli and its surroundings is one of the most seismically active regions in Turkey. The region is located at the eastern end of the 2 most important graben (Gediz and Buyuk Menderes) in Western Anatolia. Therefore, aktive (living) fault segments producing earthquakes in the region are very scattered and large and contain different zones, which causes intense seismic activity in the region. Particularly in recent years, earthquakes occurring in the region in general are the result of a complex tectonic deformation dominated by the N-S directed extensional tectonic regime in western Anatolia.
The region produced significant earthquakes in historical and instrumental periods. The faults that caused the medium-sized earthquakes occurring in recent years. In this context, the aim of the project is to reveal micro-earthquake activity and young faults in the region. The 4 earthquake stations to be established within the scope of the project will enable the seismicity of the region to be monitored very precisely. Sensitive and healthy monitoring of earthquake activities also provides valuable information about the earthquake pattern of the region. The stations to be established will reveal the characteristics, fault types, stress distributions, directions and earthquake occurrences of tectonic structures causing seismic activity in the region. Thus, scientific results within the scope of the project will make a significant contribution both in reducing earthquake risk, in urban planning and in building a resistant-conscious society in the region. The intense seismic activity occurring in the region in recent years shows that the young tectonic basins in the region continue their tectonic evolution. In this context, the Big Denizli Fault Zone (BDFZ), which is recommended within the scope of the study. It has been suspected that the earthquake activity in the vicinity of such defined faults has not been identified and that there are more active fault segments within the BDFZ. In this regard, micro-earthquake activity in the region should be monitored very regularly and precisely. Unfortunately, there are many active fault segments in the region that have not been identified and cause activity in recent years and the seismic hazard of the region is known to be very high. This is very difficult to do with the existing station distribution. Therefore, the main objective of the project is to monitor the micro-earthquakes occurring during the BDFZ, to enrich the existing seismic network and to increase the seismic threshold (M<2.9) in the region. Calculation of the source parameters of earthquakes in the region from the records to be obtained from digital broad-band earthquake stations to be established, more robust determination of the dominant stress forces and complex tectonic regime in the region, modeling of stress distribution with current data, follow-up of the process before and after the event broad-band stations to be established. In this project, which parts of the BDFZ belong to the ongoing earthquake activity in the region, deformation mechanics, kinematics and seismotectonic relationships of these segments will be investigated.
One of the main objectives of the project is to monitor the earthquake activity occurring in our region in the recent history and which is still going to be expected at the same time and the distribution of the post-earthquake earthquake (aftershocks) that may occur. The data set to be obtained in the project is to investigate whether the geothermal energy and water injections which are being used extensively in the region cause triggered earthquakes.
In this part of Western Anatolia, faults, which are generally oriented in very different directions, play an important role in the tectonic development of the region and the monitoring of the earthquake activities of these faults will add new findings to the known tectonic characteristics of the region. For this purpose, it is aimed to temporarily place 4 broad-band earthquake stations in order to keep the whole region under

control and to operate them for at least 2 years. This study is supported by Bogazici University Research Projects Commission under SRP/BAP project No:16403. We thank to Bogazici University Research Fund Commission and members.

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