



Seismicity of the Bursa Region (Turkey) and its vicinity: results from a microseismic experiment

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Since the Bursa city is located near the southwest branch of the western extension of the North Anatolian Fault (NAF) zone, the importance of the seismic hazard in the region becomes progressively more important (Sellami et al., 1997; Polat, 1997). Between the years 33-1899 AD well known destructive and damaging earthquakes occurred in the Bursa region. Although the accuracies of their epicenter locations are not well constrained, the most significant destructive and damaging historical earthquakes on the southern branch of NAF are the two succeeding earthquakes in 1855. It is believed that the first 1855 earthquake occurred on Uluabat segment and the second occurred on the Bursa segment (Eyidogan et al., 1997). As a result, any destructive and damaging earthquake has not occurred within the active fault zone since 1855.

The goal of the project was to install a seismic network for monitoring earthquake activity in around Bursa city. For this purpose, two broad-band and six short-period seismic stations have been deployed in a cooperative study by Dokuz Eylül University (Turkey) and GeoForschung Zentrum (Germany). The temporary network was operated during six months from October 2003 to April 2004. Some permanent stations of Kandilli Observatory and Earthquake Research Institute (KOERI) were also used in order to improve the precision of epicenters and assure a good azimuthal coverage of each recorded event.

We have used earthquake recordings of local events in the distance range of 60 km in order to quantify the seismicity in the vicinity of the Bursa city. We found that the

level of seismic activity in Bursa is higher than previously reported. The hypocentral distribution of the events indicates that peak seismicity for the region occurs at depths of about 20 km.

Only few earthquakes with magnitude greater than 4.0 have occurred within the study area. Although the seismicity shows very scattered distribution in space, a cluster observed at the SE of Bursa can be associated with Bursa-Inegöl plane where Eskisehir Fault and southern branch of the North Anatolian Fault Zone (NAFZ) coincide over there. Fault plane solutions of selected earthquakes are compatible with strike-slip mechanisms on an NW-SE oriented fault plane. Source parameters of few earthquakes were investigated to infer the relationship between seismic moment and stress drop.

ACKNOWLEDGEMENT

The General Directorate of State Hydraulic Works (DSI in Turkish acronym) and other governmental institutions helped us to install the stations and calibrating equipments during the project. We partially used the location data from various stations operated by Kandilli Observatory and Earthquake Research Institute (KOERI). This study is supported by TUBITAK (Turkey)-JULICH (Germany) international bilateral project with a number of 102Y156 and also by Dokuz Eylül University Scientific Research Project (BAP, DEU 2006.KB.FEN.007).

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