



Influence of the Saros Fault on the Periodicity of Earthquake Activity (Gelibolu Peninsula, NW Turkey)

Derya İpek Gültekin, Okan Karakoç, Murat Şahin, İrem Elitez, and Cenk Yalıtırak

Department of Geological Engineering, İstanbul Technical University, İstanbul, Turkey (gultekinde@itu.edu.tr)

Active faults are vital in terms of settlement and socio-economic aspects of a region. For this reason, it is important to determine the characteristics and impact areas of active faults correctly. The Marmara region is a tectonically active region located in the northwestern Anatolia. The northern part of the North Anatolian Fault, which was named the Saros Fault, passes through the westernmost part of this region. The Saros Fault is a 52 km-long and NE-SW-trending right-lateral strike-slip fault.

In this study, the seismicity of the Gelibolu Peninsula has been examined in the light of historical records. When considering the historical records, 545, 986, 1354 and 1756 earthquakes led to damage on the settlements close to the Saros Fault. The dates of historical earthquakes were calculated by integration of previously published empirical formulas, year difference between events and velocity of GPS vectors. The acceleration map (PGA MAPS) of the region has been produced by taking into account these earthquake magnitudes, fault geometry and geology of the region, and consequently, it was seen that these maps overlap quite well with the damage records of historical earthquakes. Considering the periodicity of the Saros Fault, which majorly controls the seismicity in the region, it is aimed to find an answer to the question “how does a recent earthquake affect the region?” by the help of historical earthquake records and PGA modelling. In conclusion, our data showed that PGA values are dominant in the northern side of the Gelibolu Peninsula and this region may be affected by a magnitude 7.3 earthquake.