



SEPTEMBER 26, 2019 Mw5.8 MARMARA SEA-SILIVRI (ISTANBUL) EARTHQUAKE: ANALYSIS OF GROUND MOTION RECORDS

Seyhan Okuyan Akcan¹ and Can Zulfikar²

¹Bogazici University, Civil Engineering Graduate Program, Istanbul, Turkey (seyhan.okuyan@boun.edu.tr)

²Gebze Technical University, Faculty of Engineering, Civil Engineering, Kocaeli, Turkey (aczulfikar@gtu.edu.tr)

Marmara region located on the western end of the North Anatolian Fault Zone is a tectonically active region in Turkey. There have been frequent severe earthquakes in the region and will continue to occur. There was no serious earthquake in the region after the 1999 Mw7.4 Kocaeli and Mw7.2 Düzce earthquakes. A Marmara Sea offshore earthquake Mw5.8 close to Silivri Town of Istanbul Metropolitan City has occurred on September 26, 2019 daytime at 13:59. The earthquake happened at the coordinate of 40.87N – 28.19E with a depth of 7.0km on the Kumburgaz segment of the North Anatolian Fault line. It was felt in almost all Marmara region. In some settlements in Istanbul City, slight to moderate damages were observed. A foreshock earthquake of Mw4.8 occurred on the same segment on 24 September, 2019. 150 aftershock events ranging from M1.0 to M4.1 have been recorded within the 24 hours after the mainshock. The ground motions have been recorded in the region by the several institutions including AFAD (Disaster and Emergency Management Presidency), KOERI (Kandilli Observatory and Earthquake Research Institute) and IGDAS (Istanbul Gas Distribution Industry and Trade Inc.). The ground motion records and selected parameters have been examined in this study. The ground motion parameters (MMI, PGA, PGV, Sa, Sv, Sd) distribution have been achieved and checked by the recent NGA-West2 ground motion prediction equations (GMPEs); ASK2014, CY2014 and BSSA2014. The compatibility of the GMPEs for a moderate size Marmara Sea earthquake has been examined.