

ANALYSIS OF MICRO-SEISMICITY OF ISTANBUL GREATER CITY AREA AND ACTIVE FAULTS

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Abstract

Several active or unidentified faults in Istanbul Greater City area have been proposed in some studies on geology and seismo-tectonics of Marmara region. The micro-seismic activity patterns have been evaluated to understand the relation of these faults to recent seismicity. The three earthquake catalogues of KOERI, USGS and ISC were processed and the space and time distribution of the seismic activity in the study area were examined. The micro-seismic activity reported at these catalogues apparently increased after 1970s when the earthquake detection capability has been greatly improved with the installation of the permanent stations in Marmara Sea region. The KOERI and Istanbul Municipality seismic networks were able to record the micro-seismicity down to magnitude $M = 2.0$ after 1970s. Four seismic clusterings have been distinguished in the greater city area, namely Catalca, Cebeci, Sariyer and Tuzla-Omerli clusterings. Graphical analyses of frequency of occurrence- magnitudes – time of occurrence diagrams and spatial patterns of epicenters proved that the earthquake clusterings with magnitude smaller than 3.0 are mainly associated to quarry blasts and mining activities.