## Analysis of the micro-earthquake activity in the Western Marmara Sea based on data from 2006 to 2012

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Defining the characteristics of the fault systems is mostly improved with the continuous micro-earthquake activity observations and new processing tools. Hence, a dense seismological observation network has been established in Marmara Region under the scope of the TÜRDEP (Multi-Disciplinary Earthquake Researches in High Risk Regions of Turkey Representing Different Tectonic Regimes) project. In this project, more than 40 online broad-band stations were installed in 2006.

Earthquake absolute locations were determined with the inversion of the arrival times of P- and S-waves. More than 4,200 events located in western Marmara Region, using more than 32,100 P- and 26,000 S- hand-picked arrivals. The horizontal and vertical uncertainties were found to be about 2-3 km and 3-5 km, respectively. The double-difference method was also used to improve the earthquake locations to understand the fault characteristics in the upper-crust. The P/S travel time differences between the event pairs and P/S wave cross-correlation data were used to find out relative event locations. The horizontal and vertical uncertainties of the relocated events turned out be about 600 meters and 1,500 meters, respectively.

According to the results, the trace of Main Marmara Fault (MMF) can be followed from Central Marmara Basin to Tekirdağ Trough. Generally, earthquake clusters are located within the upper crust (<15km) in this region. Between the Tekirdağ Basin and Mürefte, the earthquake clusters are not located on the main trace of MMF but highly scattered. Based on moment tensor analysis, it can be said that the normal faults are observed at these scattered clusters at the upper crust and the reverse faulting solutions are observed in the lower crust of western Marmara. This shows that the stress regime spreads to a wide region.

It is important to note that despite very dense micro-seismological stations, we did not detect micro-earthquake activity along the Ganos Fault between Mürefte and the entrance of Saroz Gulf.