



Rapid determinations of centroid moment tensor in Turkey

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Rapid determination of centroid moment tensor (CMT) of earthquakes, namely the source centroid location, focal mechanism, and magnitude is important for early disaster responses and issuing Tsunami warnings. Using the SWIFT system (Source parameter determinations based on Waveform Inversion of Fourier Transformed seismograms) developed by Nakano et al. (2008), we are developing earthquake monitoring system in Turkey. Also determinations of CMT for background seismicity can resolve the stress field in the crust, which may contribute to evaluate potential earthquake, to develop scenarios for future disastrous earthquakes, or to find hidden faults in the crust. Using data from regional network in Turkey, we have tried a waveform inversion for an $M=4.4$ earthquake that occurred about 50 km south of Sea of Marmara, of which source location is at 40.0N and 27.9E with 15 km depth (after the ANSS Comprehensive Catalog). We successfully obtained the CMT solution showing a right-lateral strike-slip fault, of which one of the nodal planes strikes ENE-WSW, corresponding to the strike of an active fault mapped here. This fault runs parallel to the north Anatolian fault, and large earthquakes of M_s 7.2 and 7.0 ruptured this fault on 1953 and 1964, respectively. Using the regional network data, we can determine CMT for earthquakes as small as magnitude about 4. Of course, the lower limit of magnitude depend on the data quality. In the research project of SATREPS – Earthquake and tsunami disaster mitigation in the Marmara region and disaster education in Turkey, we will develop CMT determination system and CMT catalogue in Turkey.