Earthquake Focal Mechanisms Along the Central Segment of the North Anatolian Fault

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The North Anatolian Fault (NAF) is one of the world's largest active continental strike-slip faults, and forms the northern margin of the Anatolian plate. Although its geologic and geomorphologic features are well defined, crustal deformation and associated seismicity around central segment of the NAF is relatively less-known. In this study, we analyzed locations and focal mechanisms of over hundred events with magnitude ≥ 3, which are recorded by 39 broadband seismic stations deployed by the North Anatolian Passive Seismic Experiment (2005-2008). The distribution of the events shows that the local seismicity in the area is widely distributed, suggesting a widespread continental deformation in the southern block. For the entire data set, P- and S- arrival times are picked and events are relocated using the HYPOCENTER program. Then, relocated events which have a good azimuthal coverage with a maximum gap of 120 and at least 13 P- wave readings are selected and 1-D inversion algorithm, VELEST, is used to derive the 1-D seismic velocity model of the region. The final model, with updated locations is later put together to the FOCMEC program, to obtain focal mechanisms solutions. In this step, an iterative scheme is applied, by increasing the number of data errors. To obtain more unique solutions, first motions are used along with SH/P wave amplitude ratios. Preliminary results indicate a dominant strike-slip mechanism in the southern block that correlates with the splays of NAF. Overall stress field is highly variable across the region, which will be mapped out by stress inversion of resultant focal mechanism solutions and available geological data.