

-Seismic Strain Accumulation and Estimation of Stress Distribution on the Main Marmara Fault

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The objective of this study is to characterize the recent stress distribution on the Main Marmara Fault (MMF) through quasi-static modeling of inter-seismic strain accumulation by considering past earthquakes and heterogeneous interseismic coupling. Since the MMF is prone to creating large earthquakes, it is crucial to infer the state of stress on the fault. The obtained pre-stress distribution will serve as a basis for simulating dynamic earthquake ruptures via derived stress changes and calculating a realistic map of the peak ground velocity. Due to lack of observed data for future events, International Monitoring System seismic stations may be used to verify future ground motion simulations for destructive earthquakes. To calculate accumulated stress distribution on the locked part of the MMF, interpolated GPS velocities and slip-rates along the unlocked portions of the fault interface are used as boundary conditions. Previous studies of interseismic coupling and seismicity studies including the repeating earthquakes are also considered. A three-dimensional-FEM mesh for the region is built using a mesh size of ~500 m. Consequently, heterogeneous stress distributions are obtained via elaborative usage of recent geodetical investigations. Because the magnitude of stress can't be measured within the earth crust, such heterogeneous stress change calculations are crucial.

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Promotional text

The Marmara Region is prone to a destructive earthquake which will affect İstanbul Metropolitan. Therefore, estimation of stress accumulation and simulations of dynamic earthquake rupture scenarios under the consideration of realistic stress loads are crucial.

Oral preference format

in-person

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