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Late Cenozoic stress field distribution in Biga Peninsula, NW Turkey

S. OZDEN (1), T. BEKLER (2), S. Z. TUTKUN (1), A. KURCER (3), O. ATES (1), F. N. BEKLER (4), and D. KALAFAT (4)

(1) Onsekiz Mart University, Geology Engineering, CANAKKALE, Turkey (ozden@comu.edu.tr), (2) Department of Geophysical Engineering, Canakkale Onsekiz Mart University, 17020, Canakkale, Turkey, (3) General Directorate Mineral Research & Exploration, M.T.A., 06520, Ankara, Turkey, (4) National Earthquake Monitoring Center, KOERI, Bogazici University, 34684, Istanbul, Turkey

Biga Peninsula is a seismically active region both in instrumental and historical period in NW Turkey. In this part, middle and southern branches of North Anatolian Fault are represented by Etili, Can-Biga, Yenice-Gonen, Manyas-Danisment, Lapseki, Sinekci, Terzialan, Dogruca, Uluabat, Edincik, Pazarkoy-Hamdibey-Kalkim, Edremit, Yigitler, Sarikoy-Inova, Troia and Karabiga Faults. All of these faults are responsible of the seismic activity in Biga Peninsula. Historical earthquakes happened in 29, 155, 170, 543, 620, 1440, 1737, 1855, 1865 and 1875. Furthermore, as for instrumental period, Saros Gulf-Murefte earthquakes (M:7.3 and M:6.3) in 1912, Erdek Gulf (M:6.4) and Can-Biga (M:6.3) in 1935, Edremit Gulf-Ayvacı k (M:6.8) in 1944, Yenice-Gonen (M:7.2) in 1953, Gonen (M:5.8) in 1964, Edremit-Bakı rcay (M:5.5) in 1971, Biga (M:5.8) in 1983, Kusgolu-Manyas (M:5.2) and Bandirma (M:5.0) in 2006. In this study, we determined the Late Cenozoic stress field distribution and present-day tectonic regimes both fault-slip data (by 253 fault planes) and earthquake focal mechanism solutions (by 58 earthquakes) were investigated by the inversion methods. The results indicate that a transtensional stress regime is dominant with a NW-SE to WNW-ESE directed compression (σ_1) and NE-SW to ENE-WSW directed extension (σ_3), which yielded a NE-SW, ENE-WSW and also E-W trending strike-slip faulting faults with a normal component. While a transtensional tectonic regime has an active component in Biga Peninsula, a local and consistent transpressional tectonic regime were determined along an E-W trending narrow zone in the northern part of the Biga Peninsula also. The tectonic regime and stress field is resulted from interactions both continental collision of Eurasian/Anatolian/Arabian plate in the east and subduction processes (roll back and/or slab-pull) of the African plate along the Cyprus and Hellenic arc in the Mediterranean region.