



Evolution of seismically active İzmir-Balıkesir Transfer Zone: A reactivated and deep-seated structure since the Miocene

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Within the Aegean extensional system, the İzmir-Balıkesir Transfer Zone (İBTZ) is a recently recognized structure that have played important role in the late Cenozoic evolution of western Anatolia by accommodating the differential deformation between the Cycladic (CCC) and the Menderes (MCC) metamorphic core complexes. There is wealth of information about the transform nature of the zone during the late Cretaceous. Some of the faults within the İBTZ have earliest record of their activity in the late Cretaceous related to closure of the Neotethys. In this contribution we will present; (i) the vertical axis rotational history of western Anatolia using paleomagnetic data from the Miocene volcano-sedimentary rocks, (ii) kinematics of the major faults based on fault slip analysis of, and (iii) focal mechanism solutions of the recent seismic activity to better understand the İBTZ since the Miocene. Paleomagnetic results reveal two discrete and opposite major rotational phases since the early Miocene. Kinematics of structures agrees with these results while three major deformational phases are identified along the İBTZ. The focal mechanism solutions of recent seismic events -such as 1992 Doğanbey, 2003 Seferihisar and 2005 Sığacık earthquakes- occurred along the İBTZ corroborate that it is still an active structure and transfers west Anatolian extensional strain into the Aegean Sea.

Combining mantle tomography, paleomagnetic, kinematic, and seismic activity along the zone suggests that the İBTZ is not only links two core complexes, the MCC and the CCC, but also corresponds to a deep-seated structure related to a tear along the subducted northern edge of the African slab. Hence, it is not only a surface expression of a tear in the subducting African slab, but also one of the main seismic sources of the region.

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