

Understanding of the rheology of the structure on the NW-SE crosssection of the North Anatolian Fault Zone around İzmit

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Anatolia is located on the Alp-Himalaya orogenic belt and consists of continental blocks which have historically different metamorphism and deformation. These blocks are separated by ophiolitic suture belts represented old oceanic crust and mantle. As a result of the continental collision of the Eurasian and African plates, the Anatolian plate is bounded by the dextral North Anatolian Fault Zone and the sinistral East Anatolian Fault Zone has been moving westward and simultaneously rotating counterclockwise since ~ 5 Ma.

The North Anatolian Fault Zone splits into two branches bounding the different tectonic units of the Pontide, Armutlu-Ovacık and Sakarya Zones from north to south in the western part of 31E longitude of Northwestern Anatolia where is showing complex geological structures.

The surface heat flow obtained from the temperature measurements in the shallow wells by different sources described to range from ~ 52 to ~ 60 mW m⁻², ~ 20 to ~ 36 mW m⁻² and ~ 25 to ~ 35 mW m⁻² in Istanbul-Zonguldak unit of Pontide Zone, Armutlu-Ovacık Zone and Sakarya Zone, respectively.

The proportion of brittle to ductile behavior of the model is governed by the local crustal geotherm derived from surface heat flow measurements for these units. Temperature dependence of strain rate in the model is controlled by the creep equation.