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Post Miocene structural elements controlling Mihalççık-Sivrihisar Region (Central Anatolia)

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The Central Anatolian basins have various spatiotemporal deformations of the neotectonic regime which is effective in Anatolia. These basins show intense deformations in the Central Anatolian Region, different tectono-stratigraphic evolutions have taken place as a result of the collision of Pontide and Anatolide-Tauride blocks. One of the best examples is the Sivrihisar-Polatlı Neogene Basin. The study area is located between Mihalççık and Sivrihisar in this basin. The basin is represented with the Mesozoic basement rocks of Tavşanlı Zone, which is unconformably overlain by the Neogene fluvial sedimentary units. The Neogene deposits include clastics, carbonates and evaporitic units. During the deposition of Neogene units, climatic changes and effects of the tectonism caused sharp and transitional succession in the basin. According to the field investigations, paleo-stress analyzes and earthquake focal mechanism solutions can be considered that the study area is under the influence of three different tectonic regimes. These are (1) the nearly N-S oriented tensional stress extensional regime affecting the Miocene-Pliocene interval of the region, and (2) the transtensional regime which was formed under NE-SW oriented tension associated with NW-SE oriented compression, that was effective from the Pliocene to Pleistocene (?), and (3) the transpressional regime, derived from NW-SE compression associated with NE-SW tension which is active today. The last regime is also supported by focal mechanism solutions of two earthquakes, expressing reverse faults with strike-slip component. Considering the field observations, paleo-stress analyzes and earthquakes focal mechanism solutions, it can be inferred that the region may represent seismic activity due to ongoing tectonic regime that are effective in the region, it may be seen that the region continues its seismic activity nowadays.

Keywords: Sivrihisar-Polatlı Basin; İnönü-Eskişehir Fault System; Neogene; paleo-stress analyzes; tectonic regime