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## Stress State Analysis and Active Tectonics of Çavdarhisar (Kütahya) Province, (NW Anatolia, Turkey) from Pre-Late Cenozoic to Quaternary

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Çavdarhisar (Kütahya) province plays a very important role to understand geology and tectonics of the Western Anatolia. Active tectonics characteristics of the region give major information about the evolution of tectonics of the Çavdarhisar (Kütahya) and surrounding areas especially from Late Cenozoic to present day. In this study, kinematic analysis of observed faults in the field and focal mechanism solutions of earthquakes from this region and surroundings are used to reveal the Late Cenozoic stress states of Çavdarhisar (Kütahya). Kinematic analysis results of the faults give four different stress state (SS) regimes from Pre-Late Miocene to Quaternary. Firstly, a main strike-slip faulting (transpressional) (SS.1) has been developed under a NE-SW local compressional tectonic regime in Pre-Late Pliocene with  $32^\circ/31^\circ$  ( $\sigma_1$ ) and  $124^\circ/10^\circ$  ( $\sigma_3$ ) trends and Rm ratio was calculated as 0.616. Secondly and consistently with first regime, a NW-SE trending extensional regime (SS.2) produce a local normal faulting presents a minimum stress with  $329^\circ/6^\circ$  ( $\sigma_3$ ) trend as in horizontal plane in the same period. Then, a NW-SE trending compressional tectonic regime has been efficient in Late Pliocene. This tectonic regime (SS.3) developed a strike-slip faulting (transtensional) has showing by a maximum stress axis by  $325^\circ/19^\circ$  ( $\sigma_1$ ) and  $60^\circ/8^\circ$  ( $\sigma_3$ ) trends and Rm ratio was calculated as 0.499. Finally, in the study area, a tectonic regime change has occurred during Quaternary time interval. This regime (SS.4) is oriented a minimum stress state trend as in horizontal plane by a NE-SW directed extensional regime produce a normal faulting in present day and shows a minimum stress with  $58^\circ/17^\circ$  ( $\sigma_3$ ) trend and Rm ratio is calculated as 0.549. Focal mechanism solutions of the earthquakes that hit the study area show NNE-SSW extension direction which is consistent with present day extensional regime of Çavdarhisar (Kütahya) and surrounding areas. The reason for the regionally effective NNE-SSW trending extensional regime in western and south western Anatolia is related with complex subduction processes between African and Anatolian plates.

Key words: Çavdarhisar, Kütahya, kinematic analysis, tectonic regime, active tectonics, stress state