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Paleomagnetic Evidence of the Neogene Tectonic Block Rotations in Eastern Anatolia

Mualla Cengiz Cinku (1), Mümtaz Hisarli (1), Mehmet Keskin (2), Timur Ustaömer (2), and Naci Orbay (1)

(1) University of Istanbul, Department of Geophysical Enginering, Istanbul, Turkey (mualla@istanbul.edu.tr), (2) University of Istanbul, Department of Geological Enginering, Istanbul,(timur@istanbul.edu.tr)

Paleomagnetic studies of Anatolia on the Neogene rocks have been interpreted mostly with the westards excursion of Anatolia due to the collision between the Arabian plate and the Eurasian plate along the Bitlis-Zağros belt. However, inside the collision zone no paleomagnetic data are available. In order to describe the deformational history of Eastern Anatolia during the Neotectonic period we carried out a palaeomagnetic study on Miocene to Quaternary volcanic rocks at 100 different sites. The results indicate that the study area is divided into several crustal blocks during the Neotectonic period. These blocks are termed here the Van Block (VB), Kars Block (KB) and the Anatolian-Pontide Block (APB). These blocks show different sense of rotations which occurred in two different phases.

A rotational pattern is obtained from south to north in the order of $\sim 20^{o}$ counterclockwise in the AB-PB and $\sim 23^{o}$clockwise rotation in the VB. Further north, however, a region with no significant rotation is defined in the KB. The differences in rotations between these blocks are observed across the NE-SW trending East Anatolian and NE Anatolian Fault Zones, indicating that the North Anatolian Fault Zone is a younger feature. AB and PB were first separated when the North Anatolian fault was formed and AB started to rotate counterclockwise during the westward tectonic escape. The significant differences in the amount of rotation between the AB- PB and the VB indicate that most of the deformation occurred in Upper Miocene and Pliocene time. Our results are in good agreement with the GPS data obtained from Anatolia.