



Monitoring Creep Movement with Terrestrial LIDAR on the Gerede - Bayramören Segment of the North Anatolian Fault Zone, Turkey

Sevgi Altınok Erayık (1), Erhan Altunel (1), Esra Tunçel (1), and Cahit Çağlar Yalçınır (2)

(1) Eskişehir Osmangazi University, Geological Engineering, Eskişehir, Turkey (altinoksevgi@gmail.com), (2) Çanakkale Onsekiz Mart University, Çan Meslek Yüksek Okulu, Çanakkale, Turkey

The North Anatolian Fault Zone (NAFZ) accommodates the westward motion of the Anatolian block relative to Eurasian plate with a slip rate of about 20 mm/yr. The Gerede - Bayramören Segment of the NAFZ ruptured during the 1944 Gerede (M:7.2) earthquake. In early 1970s, some deformations were realized on the Gerede - Bayramören Segment of the NAFZ and attributed to aseismic creep. Since then different techniques have been using to understand the nature of the creep. In order to understand the length of the creeping section and the relationship between seismic activity and creep rate, eight new stations were constructed along the Gerede - Bayramören Segment and were monitored by terrestrial LIDAR. Stations were monitored periodically since May 2013. Periodical measurements showed that the aseismic creep is going on between Gerede in west and Bayramören in east, for a distance of about 80 km. Present results showed that the creep rate changes between $2 - 6 \pm 1$ mm/yr along the Gerede Bayramören segment of the NAFZ. Considering the slip rate on the NAFZ, this segment of the NAFZ is still capable of generating large earthquakes since at least 2/3 of the yearly slip still accumulates on the fault.