Geophysical Research Abstracts
Vol. 19, EGU2017-6411-1, 2017
EGU General Assembly 2017

Preliminary Results of Three-Dimensional Magnetotelluric Imaging at the Vicinity of Nigde Massif

Sabri Bülent Tank (1), Sinan Ozaydin (1), Göksu Uslular (2), Jonathan Delph (3), Bizhan Abgarmi (4), Mustafa Karas (1,5), and Eric Sandvol (6)

(1) Bogazici University, Kandilli Observatory and E. R.I., Geophysics, Istanbul, Turkey (bulent.tank@boun.edu.tr), (2) Mugla Sitki Kocman University, Faculty of Engineering, Dept. of Geological Engineering, Mugla, Turkey, (3) Rice University, Department of Earth Sciences, Houston, USA, (4) Middle East Technical University, Faculty of Engineering, Dept. of Geological Engineering, Ankara, Turkey , (5) Istanbul Technical University, Faculty of Mining, Dept. of Geophysical Engineering, Istanbul, Turkey, (6) University of Missouri, Department of Geological Sciences, Columbia, USA

Magnetotelluric (MT) data were collected to examine the electrical resistivity structure of a metamorphic core complex known as the Niğde Massif and a northeast - southwest aligned fault zone (Central Anatolian Fault Zone, CAFZ) bounding this massif on the east in Central Anatolia. The Nigde Massif is a crystalline dome close to Inner-Tauride Suture at the southern part of Central Anatolian Crystalline Complex. The sinistral CAFZ (in the south it is called Ecemis fault) is a ∼700 km long, 2 to 80 km wide zone with an offset of 60 to 80 km. Three-dimensional numerical modeling routines based on data-space modeling (WSINV3DMT and ModEM) were used to invert the MT data collected at forty-seven high quality soundings. The resulting models suggest that (i) there is a large and circular high resistivity, dome-like anomaly that coincides with the Niğde Massif. This block includes intrusive (Üçkapılı-like) granitoids at the heart of the massif extending to northeast. (ii) Beneath the massif there is a deeper (> 25 km) and relatively higher conductive zone that may have developed as a result of partial melting and is responsible for earlier defined lateral underflow to the northeast. (iii) Clear evidence for low angle normal sense detachment faults bounding the massif were found on several cross sections. (iv) Seismically active Ecemis fault appears as a low to high conductivity interface mostly hidden beneath non-conformable Eocene cover (iv) Ulukısla basin sediments appear as a highly conductive layer. (v) Ophiolitic mélange on the southeast side of Ecemis fault dominate the area with a high conductivity layer.