

Investigation of Lithosphere Structure of Northwestern Anatolia with long-period magnetotelluric data: Part 2. comparison to the 2D inversion of broadband and long period magnetotelluric data

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SUMMARY

In our previous study, we collected Magnetotelluric (MT) data along seven South-North and two East-West directional profiles in North-Western Anatolia between 2007 and 2010. The data were measured broadband frequency (T=0.0031s to 2000s) with the Phoenix MTU-5A system on 997 stations. The station interval was approximately 3 to 5 km. In this study, the data including AMT, broadband, and long-period MT data (T=0.0001s to 10.000s) were measured in four parallel lines from which broadband MT data were previously measured. The new MT data sets were measured with 15 km station intervals under the TUBITAK project (grant no. 119Y197). We used the new generation Phoenix MTU-5C system for a long period of MT measurement that allows us remote network data transfer via cell modem. This system enables us to make quality assessments of the measurements while the receivers are still active in the field. In order to obtain long-period MT data up to 10.000 seconds period, measurements were taken at each station for 10-18 days. The measurement was terminated after making sure that the data was obtained in a period of 10.000 seconds. Broadband MT data measured in 2010 and long-period MT data measured in 2020 and 2021 at the same station were compared. It was seen that the two data groups in the same period range were broadly similar. We individually interpreted long-period MT data collected along with four profiles. 2D resistivity models were obtained up to a depth of 150 km. The new models and the previous models obtained from 2D inversion of broadband MT data inversion are compared for the first 40 km according to the tectonic structure of the region. The main tectonic zones can be distinguished in both models. For the first time, in this presentation, preliminary results will be given about the lithosphere structure of northwest Anatolia up to a depth of 150 km.

Keywords: Lithosphere, North-Western Anatolia, Long Period, Magnetotelluric, Remotely controlled, 2D inversion

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