Geophysical Research Abstracts
Vol. 18, EGU2016-15597, 2016
EGU General Assembly 2016

Metasomatism and current state of the lithospheric mantle beneath the Nógrád-Gömör Volcanic Field constrained by trace element modelling and magnetotelluric survey

Rita Klébesz (1,2), Levente Patkó (2), Attila Novák (1), Viktor Wesztergom (1), and Csaba Szabó (2)

(1) MTA CSFK Geodetic and Geophysical Institute, Sopron, Hungary (klebesz.rita@csfk.mta.hu), (2) Lithosphere Fluid Research Lab, Eötvös University, Budapest, Hungary

The Nógrád-Gömör Volcanic Field (NGVF) is one of the five mantle xenolith bearing alkali basalt locations in the Carpathian-Pannonian Region, where Plio-Pleistocene alkali basalt brought to the surface lherzolite and wehrlite xenoliths. Petrographic and geochemical signature (i.e. newly formed clinopyroxene and olivine grains, Ti, Al, Fe, Mn and LRRE enrichment in rock-forming minerals) of the wehrlite xenoliths suggest that a portion of the upper mantle was transformed to wehrlite beneath the NGVF by upward migrating mafic melt agents. Based on trace element modelling, we argue that the metasomatic agent had an OIB-like trace element composition, similar to the host alkali basalts. In order to study the current state of the lithospheric mantle and to test whether the spatial distribution of the metasomatism can be imaged, magnetotelluric (MT) survey was carried out.
Long period MT data were collected at 14 locations along a ∼50 km long NNW-SSE profile in the NGVF. The lithosphere-asthenosphere boundary was detected at 70-90 km of depth. A low resistivity anomaly (∼5-10 Ωm) was observed at 30-45 km in depth below the central part of the NNW-SSE profile, indicating the presence of a conductive body barely below the Moho. We suggest that the low resistivity body is related to the presence of residual, connected melt and/or the conductivity differences between the lherzolitic and wehrlitic mantle domain due to different chemical composition and ratio of the rock-forming minerals.