Possible link between wehrlitization of upper mantle and electrical conductivity anomaly beneath the Nógrád-Gömör Volcanic Field (Northern Pannonian Basin)

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The Nógrád-Gömör Volcanic Field (NGVF) is one of the five mantle xenolith bearing alkaline basalt locations in the Carpathian-Pannonian Region. In addition to lherzolite xenoliths, petrographic and geochemical evidence suggest that a portion of the upper mantle was transformed to wehrlite beneath the NGVF by upward migrating mafic melt agents. The nature of the metasomatic agent is fairly well constrained [1], the spatial distribution of the metasomatized mantle domain reamins unclear. However recently accuired magnetotelluric (MT) data may shed light on the extent of the metasomatism.

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 just below the Moho.

Low resistivity anomaly is commonly attributed to melts. The results of calculations with SIGMELTS [2] suggest that at least 15% interconnected partial melt is needed, considering a melt chemistry similar to the composition of the silicate melt inclusions found in the wehrlite xenoliths. However, there is no geological evidence indicating the presence of such high amount of melt. Therefore, we believe that the network of clinopyroxene-rich veins ± melt could cause the low resistivity anomaly, due to the higher electrical conductivity of clinopyroxene compared to olivine [e.g. 2]. Initial results of LitMod3D [3] modeling seems to support our hypothesis.

[1] Patkó *et al*. (2015) *Goldschmidt2015 Abstracts,* this volume. [2] Pommier & Le-Trong (2011) *Comput Geosci* **37**, 1450-1459. [3] Fullea, Muller & Jones (2011) *J Geophys Res-Sol Ea* **116**, B10202.