

The origin of internal reflectivity within the Kevitsa intrusion

N. Hellqvist^{1*}, E. Koivisto¹, A. Malehmir², I. Kukkonen³ and P. Heikkinen¹

¹*Department of Geosciences and Geography, P.O. Box 68, 00014, University of Helsinki, FINLAND (*correspondence: niina.hellqvist@helsinki.fi)*

²*Department of Earth Sciences, Uppsala University*

³*Department of Physics, University of Helsinki*

The Kevitsa mafic-ultramafic intrusion hosts large Ni-Cu-PGE disseminated sulfide deposit and is located within the Central Lapland Greenstone Belt in northern Finland. A vast number of geophysical and geological datasets, in particular extensive borehole data and 3D reflection seismic data used in this study, is available from Kevitsa.

Data mining approaches, such as Self-Organizing Map (SOM; Kohonen 2001) analysis, can be used for joint interpretation and objective analysis of the complex geophysical and geological datasets typical for mining camps. In this work, we are presenting initial results from SOM analysis of Kevitsa borehole data with the aim of understanding the origin of spatially constrained internal reflectivity within the Kevitsa intrusion, and its relationship to the Kevitsa Ni-Cu-PGE deposit. Earlier (e.g. Koivisto et al. 2015) it has been suggested that the internal reflectivity originates from contacts between the tops and bottoms of smaller-scale, laterally discontinuous and internally differentiated olivine pyroxenite pulses within the intrusion, which have also been suggested to control the extent of the economic mineralization accumulated towards the bases of the pulses (Gregory et al. 2011). However, our initial results show that the origin of the internal reflectivity is more complicated. While the smaller-scale magmatic layers could potentially explain some of it, more detailed analyses are required to fully understand the origin of the reflectivity and its relationship to the Kevitsa Ni-Cu-PGE deposit.

References:

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