



## **Estimation of mineral and chemical composition of lithosphere by seismic and gravimetric data**

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New method of quantitative geological data interpretation of geophysical data is developed. Method calculates effective petrophysical parameters (velocity, density) in defined thermo-baric conditions for multi-component model of rock. The elements of model are present by systems (ensembles) of main minerals and fractures. Using velocity model of deep seismic sounding (DSS), gravity field and depth-temperature curve we calculate estimation of main minerals volume content. The regional database, which contains of petrophysical properties of minerals, their behavior in desired conditions and average composition, is made.

For the Northern-west part of Ukrainian shield, interpretation of DSS profiles has been made. Main 10 minerals or their averaged “model proxy” (quartz, anorthite, albite, biotite, “olivine”, “amphibole”, “clynopyroxene”, “orthopyroxene”, “potash feldspar”, “garnet”) distribution has been calculated. Mineral content was converted to chemical composition ( $\text{SiO}_2$ ,  $\text{TiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{FeO}$ ,  $\text{Fe}_2\text{O}_3$ ,  $\text{MgO}$ ,  $\text{MnO}$ ,  $\text{CaO}$ ,  $\text{Na}_2\text{O}$ ,  $\text{K}_2\text{O}$ ) distribution.

For studied region we don't looks serious differentiation for lower part of crust (below 20 km). In upper part of mantle (40-50 km) averaged composition is similar to ultrabasic rock ( $\text{SiO}_2 < 50\%$ ). From down to up basicity generally descents. But in the upper part of crust (0-20 km) we can see different structures with  $\text{SiO}_2$  from 66% till 74%. For the surface part we have good correlation between modelling data and geological surveys.