08.01 Young Scientist Session

Preliminary results of integrating surficial geochemistry with geophysical models on the case study of Ransko Mt., Czech Republic

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Surficial geochemistry and geophysics are two valuable tools for exploration geologists. In particular, surficial geochemistry, based on the compositional analysis of plant samples, has proven to be an indicator of lithological differences where outcrops are scarce or unavailable. Geophysical methods, such as electromagnetic surveys, offer a non-invasive means of measuring proxies of subsurface lithology. However, interpreting geophysical data requires inversion to produce 3D models, a process that can be improved by incorporating geological knowledge into the inversion algorithms. This knowledge-driven approach can also be supported by the geochemistry of plants.

This study uses data from a test site within the Horizon Europe SEMACRET project, which is located in an orthomagmatic intrusion featuring mineralisations. Data collection aimed to investigate the effectiveness of surficial geochemistry and electromagnetic surveys in detecting shallow and deep-seated mineralisations. The results show that geophysical data inversion and plant geochemistry provide complementary insights into the bedrock, offering a more robust proxy for lithological interpretation together. This study explores the potential of combining surficial geochemistry with geophysical models (resistivity and chargeability), and we present preliminary results from this investigation. This integrated approach has significant implications for exploration geology, exploiting techniques which are applicable even when sample numbers are comparatively low, which would otherwise inhibit classical machine learning-driven prospectivity modelling.