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Characteristics of natural background radiation in selected underground laboratories BSUIN and EUL projects.

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One of the most important parameters characterizing underground laboratories is natural background radiation. In underground locations, natural radiation mainly comes from the surrounding bedrock and used building materials. When selecting an underground site for research and projects, great importance is attached to the conditions prevailing there, which translates into the success of the activities carried out. Accurate measurements of natural radiation are therefore essential to guarantee the success of the project. As a part of the BSUIN (Baltic Sea Underground Innovation Network) project, such measurements were carried out in several underground laboratories. Although the BSUIN project ended last year, this research continues under the ongoing EUL (Empowering Underground Laboratories Network Usage) project.

Results of the in-situ measurements of gamma radiation and radon concentration will be presented. Additionally, laboratory measurements of radioisotope concentrations in rock and water samples from the studied sites were performed. The concentration of radioisotopes in water samples was obtained by using a liquid scintillation α / β counter and α spectrometry, while the concentration of radioisotopes in rock samples was measured with laboratory gamma-ray and α spectrometry.

A comparison of the obtained results of natural background radiation with other underground locations will also be presented.