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Natural background measurements: pilot measurements from BSUIN underground laboratories

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Baltic Sea Region Underground Innovation Network (BSUIN) consists of six underground laboratories. Each of the underground laboratories are unique in their geology and thus in their natural background radiation. To be able to compare different location any measurements alone are not enough for comparison, but also the methodology needs to be constant.

We present the technologies and measurement procedure from natural background radiation including

- Gamma ray spectrum measurements with different technologies,
- Neutron flux measurement with a dedicated setup,
- Radon measurements.

The variety of different methods in gamma ray spectrum measurements is from large scale systems with high resolution systems to small portable systems with less accuracy but also more affordable. As all the systems are piloted in same locations comparison between methods can be done. Depending on the planned use of underground laboratories or facilities appropriate methods can be used for natural background radiation measurements. As an extreme example the background characterization accuracy requirements for underground physics experiments is much higher than for general purpose underground halls.

The pilot measurements provide also essential information for the underground laboratories to choose appropriate methods for natural background radiation measurements to develop their services and working environment.

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