

## A new HPGe spectrometer with $\mu\text{Bq/kg}$ sensitivity for sample analysis

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Low-level gamma spectroscopy with High Purity Germanium (HPGe) detectors has become an essential tool for material screening in rare event physics experiments. These demand lowest possible radioactivity concentrations near their target or detector array. Typical examples are searches for solar neutrinos, neutrinoless double beta decay and dark matter.

A new HPGe spectrometer, called GeRysy, has been installed in Hall C of the underground laboratory at Canfranc (LSC). It is based on a 2.3 kg germanium crystal and fabricated in the SAGe-well geometry by Canberra. The design of the detector and its cryostat was highly customized. It was placed in a dedicated multi-layer shield to eliminate the influence of local gamma radiation on the background. The materials used to fabricate the shield components (copper, lead of various qualities) were carefully selected with respect to radio-purity. Radon impact is suppressed by flushing the shield either by Rn-free air available at LSC, or by nitrogen gas.

After several test measurements we conclude that we have reached very low level of background, which makes possible measurements with sensitivities down to single  $\mu\text{Bq/kg}$  (1 ppt U/Th equivalent) for various samples. This makes GeRysy one of the most sensitive gamma spectrometer world-wide. Construction of the detector, background analysis and selected results obtained for various samples will be discussed. A prospect for installation of further detectors at LSC will be outlined

### Collaboration you are representing

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