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Low-background radioactivity counting at the most sensitive HPGe detector in Germany

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The contribution reports about the commissioning of an ultra low-level ⊠-ray counting setup in the shallow-underground laboratory Felsenkeller in Dresden, Germany. It includes a high-purity germanium detector of 163 % relative efficiency within passive and active shields. The passive shield consists of 45 m rock overburden (140 meters water equivalent), 40cm of low-activity concrete, 15 cm of high purity lead, 10 cm of oxygen-free radiopure copper, and an anti-radon box. The active veto is realized by five large plastic scintillation panels surrounding the setup. All together, these shieldings attenuate the remaining background rate down to 116(1) $\mathrm{kg^{-1}d^{-1}}$ in an energy interval of [40 keV;2700 keV]. This is the lowest background of any HPGe detector in Germany, among the lowest worldwide, and enables studies of samples well below 1 mBq. In addition to the design of the setup, the underlying analysis techniques will be presented.

Submitted on behalf of a Collaboration?

No

Primary author: TURKAT, Steffen (TU Dresden)

Co-authors: Dr DOMULA, Alexander (TU Dresden); BOELTZIG, Axel (Helmholtz-Zentrum Dresden-Rossendorf (HZDR)); BEMMERER, Daniel; Mr KOCH, Jonas (TU Dresden); ZUBER, Kai (Technische Universitaet Dresden); SCHMIDT, Konrad; Mr OSSWALD, Max (TU Dresden); Mr LOSSIN, Till (TU Dresden)

Presenter: TURKAT, Steffen (TU Dresden)

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