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## **Development of methods for the ultra-sensitive analysis of background sources in deep-underground experiments**

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To study rare nuclear processes like neutrinoless double beta decay or dark matter scattering of atomic nuclei, a sensitive detector with a very low background is needed. To reduce the background components from cosmic rays, such a detection system is often located deep underground with an anti-cosmic veto. The background of the experiment is therefore dominated by natural radioactivity in the construction materials of the detector and surrounding area. To eliminate this contribution, radioactive pure materials have to be selected for construction and very high sensitivity methods are required for the determination of radiation content. A special challenge represents naturally occurring long-lived isotopes of uranium and thorium, that form decay chains. Several methods can be used for the determination of these radionuclides; however, the best detection limit can be achieved with mass spectrometry methods. Preliminary results from using AMS (accelerator mass spectrometry) and ICP MS (inductively coupled plasma mass spectrometry) will be presented.

### **Submitted on behalf of a Collaboration?**

No

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