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Radioassay of lead samples using an array of HPGe detectors

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Lead is the most popular material to shield the external gamma-ray. The radioactivity of the lead shielding is important for the rare event search experiments, such as neutrinoless double beta decay and weakly interacting massive particle searches. In the rare event searches, the radioactivity of the lead shielding itself may contribute significant background signals. We cannot measure the radioactivity of the lead below mBq/kg level using the single HPGe detector due to self-absorption and reduction of the detector background by the high effective atomic number of lead. In our study, the activity levels of contaminants in lead samples were measured using an array of fourteen-channel HPGe detectors with the consideration of the screen effects.

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