

SAUNA III New Beta Detector Performance

To achieve the design requirements for the SAUNA III radio-xenon measurement system a new beta detector cell has been developed. The new detector was designed to handle the considerably larger sample size and the change in carrier gas from helium to nitrogen, with maintained or improved detector sensitivity and energy resolution. The first detectors of the new design have been produced and installed in the SAUNA III prototype and measurement results can be compared with the Monte-Carlo simulations that were used in the design of the new detector. The detector performance has been studied with respect to gas composition, sample size and cell pressure. The achieved minimum detectable concentration (MDC) for the different xenon isotopes when used in a SAUNA III system will also be presented.

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