

On-line ^{222}Rn purification for liquid xenon detectors by means of cryogenic distillation

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Content

The radioactive noble gas radon is an important source of internal background in many dark matter experiments based on liquid xenon. Due to emanation, ^{222}Rn is permanently released into the detectors' liquid xenon targets. Careful material selection based on their radon emanation rate is a powerful strategy to mitigate background. In order to achieve further radon reduction, we discuss the concept and the successful operation of an continuously operated radon removal system for liquid xenon detectors. Thereby, the separation of radon from xenon is done by means of cryogenic distillation, a technique suitable even at concentrations down to the 10^{-15} mol/mol level.

Summary

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