

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

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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 a 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.

Primary author: Mr BRUENNER, Stefan (Max-Planck Institut fuer Kernphysik)

Presenter: Mr BRUENNER, Stefan (Max-Planck Institut fuer Kernphysik)

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