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Design of an alpha contamination detector with high sensitivity

Particle Physics' experiments are currently searching for events whose probability is extremely low, such as the neutrinoless double beta decay or dark matter candidates such as WIMPs. This is what causes the need to perform highly sensitive experiments in subterranean facilities that shield from cosmic rays and environmental radiation. However, there is a radiation which is always present, that from Radon.

The goal of my work is the design and development, simulating in the REST environment, of this alpha detector. Such a detector must be able to characterize the alpha background caused by the decay chain of ^{222}Rn in the active volume of the detector and that of its products on the internal surfaces (especially the ^{210}Po , whose decay period is longer than that of the rest of the isotopes of the chain). To this end, I am characterizing and studying the response of this alpha detector, which is still under development by GIFNA and whose final result will be of great interest for the experiments being carried out at the LSC facilities.

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