STUDY OF RADON-222 DECAY IN LIME

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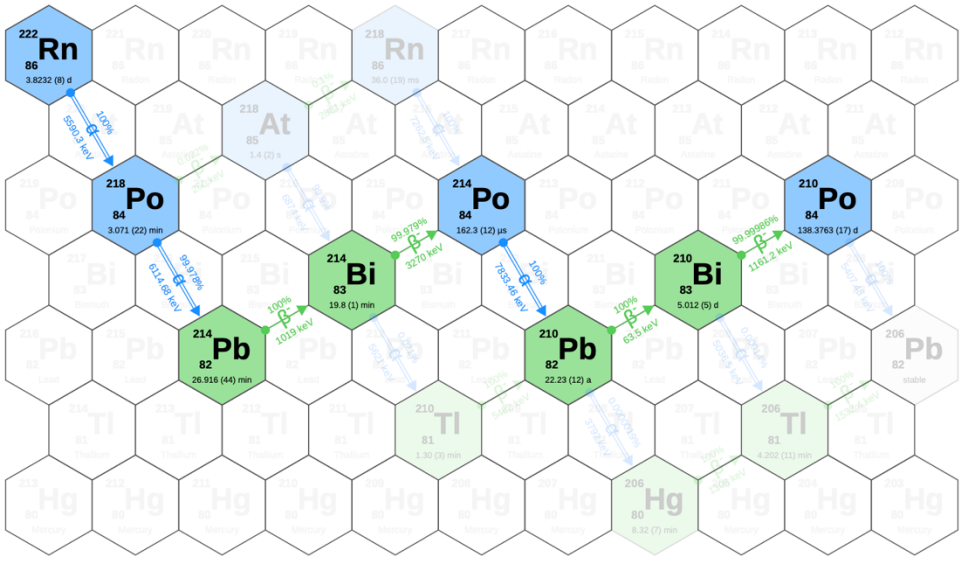
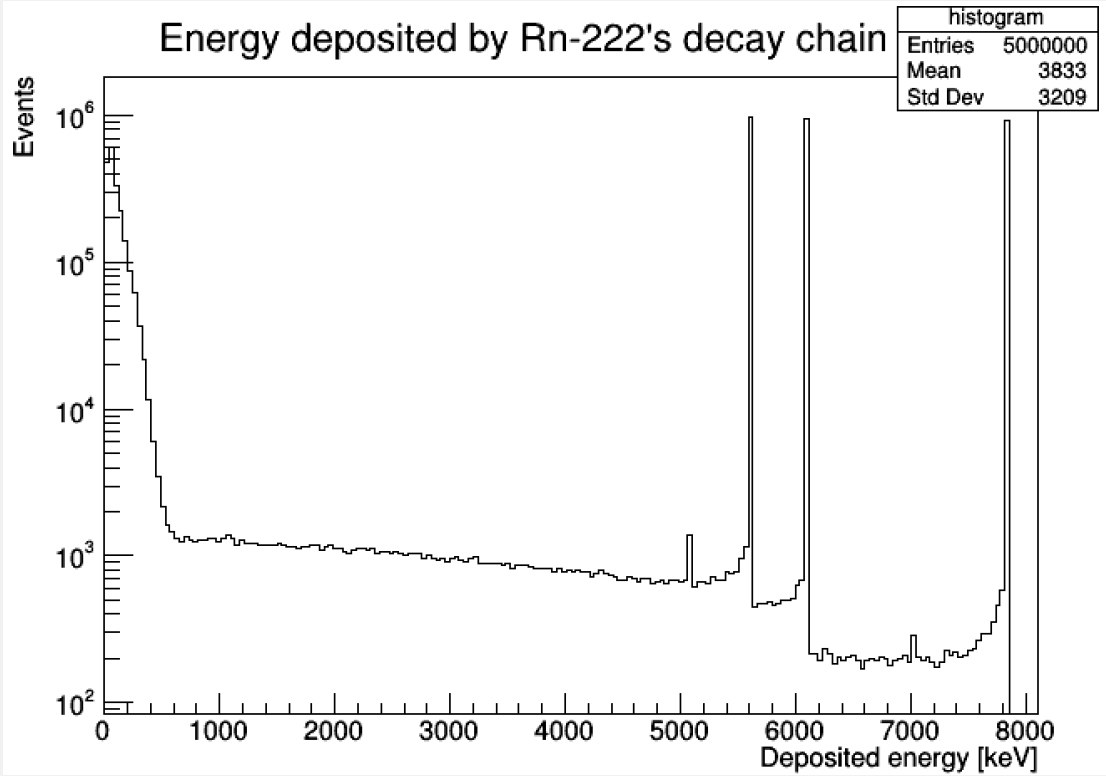
General meeting 17/06/2025

RADON-222 DECAY CHAIN





- We aim to study radon contamination in the LIME detector through the analysis of decay chains with MC simulations.
- We want to compare the simulation results (post-digitization) with experimental data.

- I simulated with Geant4 one million events for each of the decay products of the Radon chain, uniformly distributed on a line in the center of the sensitive region.
- We are evaluating how radon contaminations may contribute to the low-energy background in experimental data. The radon chain can contribute in two ways: with de-excitation photons or beta eletrons that have continuous spectrum but are only partially contained in the sensitive region.

AIMS OF THE THESIS & QUESTIONS

AIMS:

- Digitize the data obtained from the simulation

- Compare simulation results with data collected by LIME

- We want to understand the shape of the low-energy background present in the experimental data and to analyze what is the contribution of radon to this background.

- As part of my work, I also simulated the decay of polonium-214 uniformly distributed along the cathode. After digitization, we aim to compare the simulated data of Pb-210 recoil with the signals analyzed by Giorgio Dho and Stefano Piacentini.

QUESTIONS:

- Does it make sense to produce beta-decaying nuclei at specific locations to investigate the effect of the cutoff due to the limited size of the sensitive region?

- Does anyone know the correct Quenching Factor to apply to the Monte Carlo simulation in order to compare the simulated data with the experimental results?