

Towards a 0nbb decay search in the LUX-ZEPLIN experiment: mitigating gamma-ray backgrounds

Tuesday 8 April 2025 14:15 (15 minutes)

Dual-phase xenon time projection chambers (TPCs), such as the one at the core of the LUX-ZEPLIN (LZ) experiment, are expected to be well-suited for the search of the neutrinoless double beta decay of ^{136}Xe . In LZ, this rare-event search is primarily limited by the presence of gamma ray backgrounds in the signal's energy region of interest from the decays of ^{214}Bi and ^{208}Tl . These backgrounds, multi-site interactions misreconstructed as single-site, can be mitigated by exploiting differences between the topologies of multiple versus single scatters in the TPC. In this talk, I present a new method to unfold event topologies through the deconvolution of detector response from signal waveforms. This technique enables higher granularity in topology reconstruction, and a more effective mitigation of gamma-ray backgrounds.

Author: JACQUET, Elisa Elena

Presenter: JACQUET, Elisa Elena

Session Classification: Terrestrial Dark Matter Searches

Track Classification: Terrestrial Dark Matter Searches