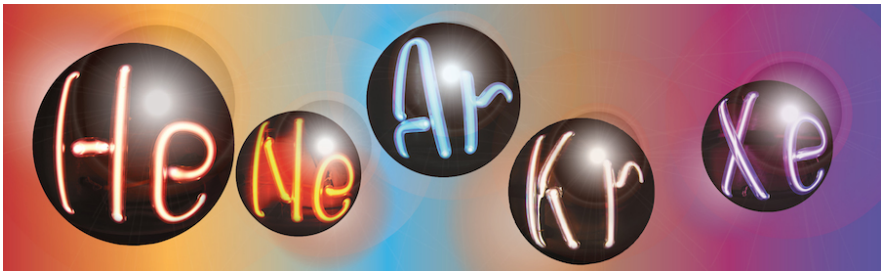

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Towards a 0νββ decay search in the LUX-ZEPLIN experiment: mitigating gamma-ray backgrounds

Thursday, 23 October 2025 13:40 (20 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 mis-reconstructed 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.

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