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Lightmap reconstruction in nEXO with an internal xenon 127 source

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The nEXO experiment is a planned ton-scale liquid xenon time projection chamber (TPC) designed to search for neutrinoless double beta decay (0vBB) with a half-life sensitivity beyond 10^{28} years. Optimal energy resolution in nEXO requires the precise reconstruction of the scintillation light signal, corrected by the position- and time-dependent light collection efficiency (or “lightmap”) throughout the active volume. An injected xenon 127 source is being considered for the lightmap reconstruction as it allows for in-situ calibrations of the light response, particularly in the center of the TPC where the use of external sources is limited by the attenuation of gammas in the liquid xenon. Multiple potential techniques for lightmap reconstruction are being explored, including a neural net and a kernel smoothing algorithm. This talk will present projections of the lightmap reconstruction capability from simulated xenon 127 decays and a discussion of the techniques involved.

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Session Classification: Signal Reconstruction (2C)

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