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Event reconstruction in NEXT using the ML-EM algorithm

The NEXT collaboration aims to find the neutrinoless double beta decay in Xe136. The rareness of this decay demands an exceptional background rejection. This can be obtained with an excellent energy resolution, which has been already demonstrated in the NEXT prototypes. In addition to this, the 2ß0ν decay in gas produces a characteristic topological signal which could be an extremely useful extra handle to avoid background events.

The need for a satisfactory topology reconstruction has led the NEXT Collaboration to implement the Maximum Likelihood Expectation Maximization method (ML-EM) in the data processing scheme. ML-EM is a generic iterative algorithm for many kinds of inverse problems. Although this method is well known in medical imaging and has been used widely in Positron Emission Tomography, it has never been applied to a time projection chamber. First results and studies of the performance of the method will be presented in this poster.

Summary

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