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Deep Neural Networks for Energy and Position Reconstruction in EXO-200

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The EXO-200 experiment is dedicated to the search of neutrinoless double beta ($0\nu\beta\beta$) decay in liquid xenon enriched in the isotope 136. A single-phase time projection chamber (TPC), containing 110 kg of active mass, is realized in an ultra-low background environment where both ionization charge and scintillation light is detected. Both channels are combined for improved energy resolution and better background rejection. Conventional multivariate analyses have been performed on the first two years of data with one of the most sensitive results on $0\nu\beta\beta$ decay and data taking in Phase-II is ongoing. Novel approaches of data analysis on the basis of deep learning were implemented and promising first results were achieved towards better reconstruction of events in EXO-200.

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Collaboration name

EXO-200

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