It is possible to compare the generated neutrino energy with the true proton energy by calculating the kinetic energy. The true proton energy is measured using the proton stopping power in liquid argon, as tabulated in [1].

**Selection Efficiency**

The selection efficiency of the algorithm is obtained by calculating the fraction of events selected in a Monte Carlo sample. The true neutrino vertex must lie within a fiducial volume.

**EVENT SELECTION**

- The spatial distribution of the deposited charge is translated into an estimation of the emitted scintillation light. These scintillation photons are then propagated towards the PMTs to construct a flash hypothesis using only time projection chamber information.
- A flash-matching algorithm compares the reconstructed flash object as seen by the PMTs with the hypothetical flash for all possible neutrino candidates and picks the best matching candidate [3].

**ENERGY RECONSTRUCTION**

**Electron energy**

The calibration slope is measured using a Monte Carlo simulation. We compare the reconstructed energy, obtained converting the collected charge into deposited energy [4], with the true electron energy.

**Proton energy**

The calibration slope is measured using a Monte Carlo simulation. We convert the track length into energy using the stopping power in liquid argon. The reconstructed energy is compared with the true proton energy.

**Total deposited energy**

The total deposited energy \( E_{\text{deposit}} \) is defined as the sum of the reconstructed track energy, corrected by the proton calibration slope, and the reconstructed electron energy, corrected by the electron calibration slope.

\[
E_{\text{deposit}} = \sum_{i=1}^{n} E_{\text{track}}(i) + \sum_{i=1}^{n} E_{\text{elec}}(i)
\]

where \( n \) is the number of reconstructed tracks and \( n \) is the number of reconstructed showers.

**POST-SELECTION CUTS**

Several kinematic and calorimetric variables can be used to select the \( \nu_e \) CC0-\( \pi^- \)-Np events. The cuts can be used to reduce both the neutrino and the cosmogenic background, and ensure that the selected events are well reconstructed.

**SIDEBANDS DISTRIBUTIONS**

In order to isolate NC events, we require the leading shower to have its \( dE/dx \) between 3.2 MeV/cm and 5 MeV/cm. We do not have any requirement on the distance between the leading shower and reconstructed neutrino vertex.

We obtain a sample with 47% NC purity.

**FUTURE IMPROVEMENTS**

- **Improve Efficiency**: Improvements in the pattern recognition and classification software will allow to recover the events where the topology requirement was not met (11.1% of the total) or in which we did not have any reconstructed neutrino candidate (8.9%).
- **Improve Purity**: The Cosmic-ray tagger (CRT) [6] will improve cosmic event rejection. This is very important, especially at low energies, where the largest component of events is represented by cosmic interactions wrongly selected as neutrino candidates (0.5%) or with a neutrino candidate contaminated by cosmic activity (0.1%).
- **Lower Energy Threshold**: A new set of cosmic-ray rejection algorithms has been developed and will be implemented in the near future, increasing the efficiency, especially in the low-energy region.