

# Performance of a 250L liquid Argon TPC for sub-GeV charged particle identification

J-PARC T32 collaboration

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## Abstract

We have constructed a Liquid Argon time projection chamber (LArTPC) detector with fiducial mass of 150 kg (250L Detector) as a part of the R&D program of the next generation neutrino and nucleon decay detector.

This paper describes a study of particle identification performance of the 250L Detector using well-defined charged particles (pions, kaons, and protons) with momentum of  $\sim 800$  MeV/c obtained at J-PARC K1.1Br beamline.

*Keywords:*

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## 1. Introduction

## 2. Experimental Apparatus

### 2.1. K1.1Br Beamline

### 2.2. 250L Detector

### 2.3. Beamline Equipment

### 2.4. Oct/2010 Beam Test

## 3. Data Sample

### 3.1. Collected Data

### 3.2. Noise Reduction

### 3.3. Hit Finding/Clustering

## 4. Detector Calibration

### 4.1. Channel-by-Channel Calibration

### 4.2. Liquid Argon Purity

### 4.3. ("Cross Talk")

## 5. Simulation Tuning

## 6. Pion Result

## 7. Proton Result

### 7.1. (Recombination)?

## 8. Kaon Result

## 9. Summary

## References

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