

Proposal Updates

- We need to update the proposal with the new strategy as explained in Kajita-san's presentation file.
- We should have the first draft finished if possible by Jan 10th.
- After we hear and discuss today's results we should start the modifications.
- **I annotated the current table of contents with the proposed new text/sections to guide the work.**

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Where new information can go in the proposal.

Contents

1 Project Description

2 Physics Goals of the J-PARC Neutrino Project

- 2.1 Introduction
- 2.2 Searching for ν_e Appearance
- 2.3 The T2K Experiment **Expand including the 280m**

3 The Neutrino Beam at J-PARC

- 3.1 Beam profile
- 3.2 Flux dependence on beam misalignments
- 3.3 Beam alignment measurements
- 3.4 Left-Right Beam Monitor Detector
- 3.5 Monitor Detector Simulation Results

Add section about NA49

4 The Far Detector

- 4.1 Super-Kamiokande

Expand with the strategy of how 2KM works with 280m/NA49

5 Motivation for the 2KM Detector

Clearly identify WC/LaR sections with justification for FGD/LaR

Where new information can go in the proposal II.

9 Muon Range Detector

9.1 Overall Design

9.2 Scintillator Detector

9.3 Readout Electronics

Add MRD/fiber tests

10 The 2KM Detector Simulation and Performace

10.1 Water Cherenkov Simulation Results

10.1.1 Validation and Initial Tuning using K2K 1kton Data

10.1.2 Selection of a Configuration to Match Super-Kamiokande Resolution

10.1.3 Event Reconstruction Performance with Selected Configuration

10.2 Liquid Argon Simulation Results

10.2.1 Hit, cluster and track reconstruction

10.2.2 e/π^0 separation

10.2.3 π^0 selection

10.2.4 Hadron identification

10.2.5 Event reconstruction, selection and classification

10.2.6 Muon momentum resolution

10.2.7 Neutrino and hadron energy resolution

10.2.8 QE/non-QE measurement

10.2.9 Events in the Inner Target

10.3 Muon Ranger Simulation Results

10.3.1 MRD Simulation

10.3.2 MRD Track and Energy Reconstruction

10.3.3 Combined WC/MRD Acceptance and Resolution

Describe pi0 rejection nue component measurement more quantitatively

Where new information can go in the proposal III.

11 Physics with the Intermediate Detector	Global strategy
11.1 Measurement of the Background for ν_e Appearance	
11.1.1 Neutral Current π^0 Backgrounds	
11.1.2 Intrinsic Beam Electron Neutrinos	
11.1.3 Misidentified Charged Current Background	
11.1.4 Prediction of the Background for ν_e Appearance at Super-K using the 2km detector.	
11.2 Measurement of the ν_μ Neutrino Spectrum	Can verify the 280m nonQE/QE
11.3 Physics in the 2nd Phase T2K Experiment with the 2KM Detector	

- **New nonQE/QE section?**
- **Combination with results from 280m (figures from 8,9,10,11)**
- **Timelines**

Note: We will quote 280m “plans” for combining results but we still need to quantitatively justify the 2KM standalone results in this document. We should emphasize both.