J-PARC Neutrino Facility (J-PARC Accelerator Complex and Neutrino Beam Facility), as a world first super neutrino beam facility with MW class high energy proton source, comes to reality within about one year.

As a first phase experiment utilizes J-PARC Neutrino Facility, Long Baseline Neutrino Experiment T2K (J-PARC Neutrino Facility + SuperKamiokande + ND280) focuses especially on the discovery of the ν_μ to ν_e conversion phenomena and, as a consequence, the finite value of the θ_{13} mixing angle.

Within a few years of experimental period, critical information, which guides the future direction of the neutrino physics, will be obtained based on the data corresponds to about 1MW times 10^7seconds integrated proton power on the target (roughly corresponds to 3σ discovery at $\sin^2 2\theta_{13}>0.05$). Moreover, a realistic first step power improvement scenario at J-PARC Accelerator Complex is proposed (LINAC energy is recovered to be 400MeV, h=1 operation at Rapid Cycling Synchrotron and 1.92 seconds repetition cycle operation at Main Ring Synchrotron), recently.

At this workshop, we would like to initiate the discussion on the second phase experiment at J-PARC Neutrino Facility. Clarifying the next discovery target, based on the realistic facility improvement scenario, after the discovery of the ν_μ to ν_e conversion, is naturally the main subject of the discussion. We would like to be as specific as possible. Let's assume followings

1. The discovery of the ν_μ to ν_e conversion has been established at a level of $\sin^2 2\theta_{13}>0.03$ (roughly corresponds to 3σ discovery at 2×10^7MW・seconds integrated proton power on target at T2K)
2. J-PARC Neutrino Facility is operated as,

Proton Energy:	30GeV
Particles/Bunch:	8.3×10^{13}
No. of Bunches/Pulse:	8
Repetition Cycle:	1.92 seconds
Proton Beam Power:	1.66MW
Time for Experiment/Year:	10^7 seconds
Protons on Target/year:	3.45×10^{21}
Neutrino Beam Off-Axis Angle:	2.5° to Kamioka fixed

3. The main neutrino detector adopts either Liquid Ar TPC detector technology or

Water Cherenkov detector technology.

4. Experimental period is assumed to be
   Scenario A. 5 years (5×10^7 seconds)
   Scenario B. 10 years (10×10^7 seconds)
   shared for ν and anti-ν horn settings (how to share is up to experimental method.)

Discussion includes:

1. Physics case of the discovery (CP violation effect in the lepton sector, etc.)
2. Strategy to extract physics results
3. Assumption about the location (baseline and off-axis angle) and the size of the main neutrino detector
4. The realistic step to realize huge main neutrino detector (what is achieved and what should be achieved to realize experiment.)

Naturally, main neutrino detector tends to be huge. As a consequence, main neutrino detector gives us rare and important opportunity to discover Proton Decay. Thus, we would also like to discuss

5. The discovery potential for the proton decay with huge Liquid Ar TPC or Water Cherenkov detector

at this workshop.