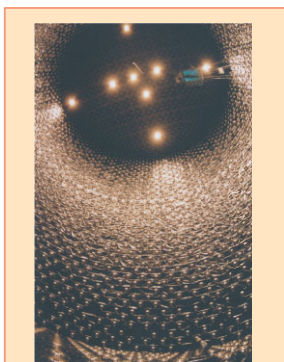


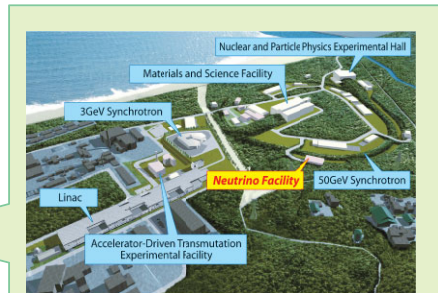
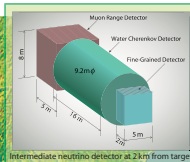
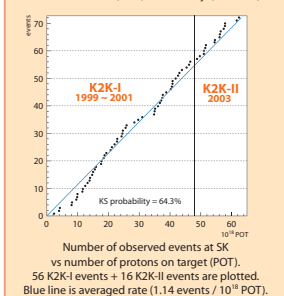
Progress of K2K: New Analysis for Phase-I and Successful Start of Phase-II

<http://neutrino.kek.jp/>

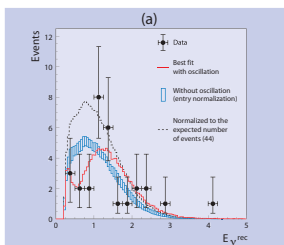
K2K, the first long-baseline neutrino oscillation experiment in operation, has collected one-half of its planned 10^{20} protons on target through July 2001 (K2K-I). We have collected 56 events in Super-Kamiokande, compared to the expectation, $80.1^{+6.2}_{-5.4}$. We use 29 single-ring muon like events to study the energy spectrum distortion. The probability that these results are caused by statistical fluctuation without neutrino oscillation is less than 1%. A limit for ν_e appearance mode has been obtained: $\sin^2 2\theta_{\mu e} < 0.15$ at $\Delta m^2 = 2.8 \times 10^{-3} \text{ eV}^2$. The new phase of the experiment, K2K-II, which started after the recovery from the Super-Kamiokande accident, will provide sufficient statistics for further study on neutrino oscillation. As of April 21st, 16 more events have been obtained, compared to the expectation, $26.6^{+2.3}_{-2.6}$.



Super-Kamiokande after its recovery from the accident (ICRR, Univ. of Tokyo, 2002/09).

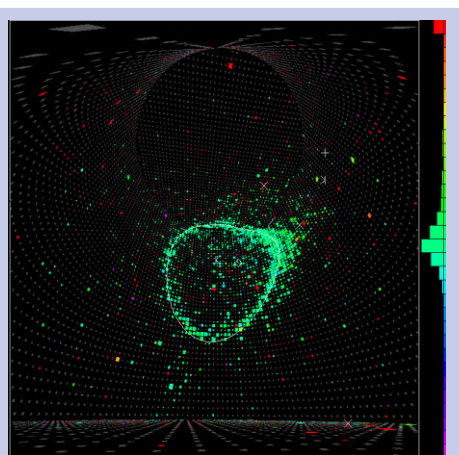
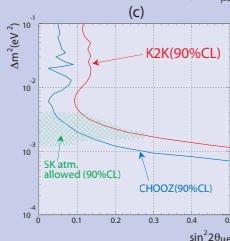
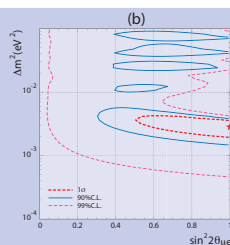


J-PARC, Japan Proton Accelerator Research Complex. Neutrino beamline facilities will be constructed at 50 GeV Proton Synchrotron (PS), which will provide a beam ~100 times more intense than KEK-PS.



K2K-I oscillation analysis plots

(a) Reconstructed E_μ distribution for the single ring muon-like samples, overlaid with various MC expectations.



A KEK-beam produced Super-Kamiokande event



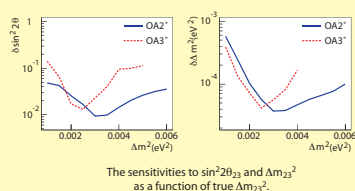
Bird's-eye view of the neutrino beam-line at KEK. It provides a 98% pure wide-band $< E_\mu > 1.3 \text{ GeV}$ muon neutrino beam from the KEK 12 GeV PS. A near detector system is located 300 m downstream from the target.



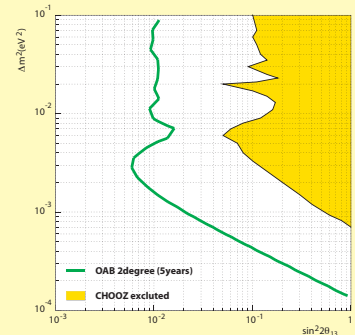
Installation of a new near detector module, Sci-Bar, is taking place since January 2003.

Next Generation Long-Baseline Neutrino Oscillation Experiment at J-PARC

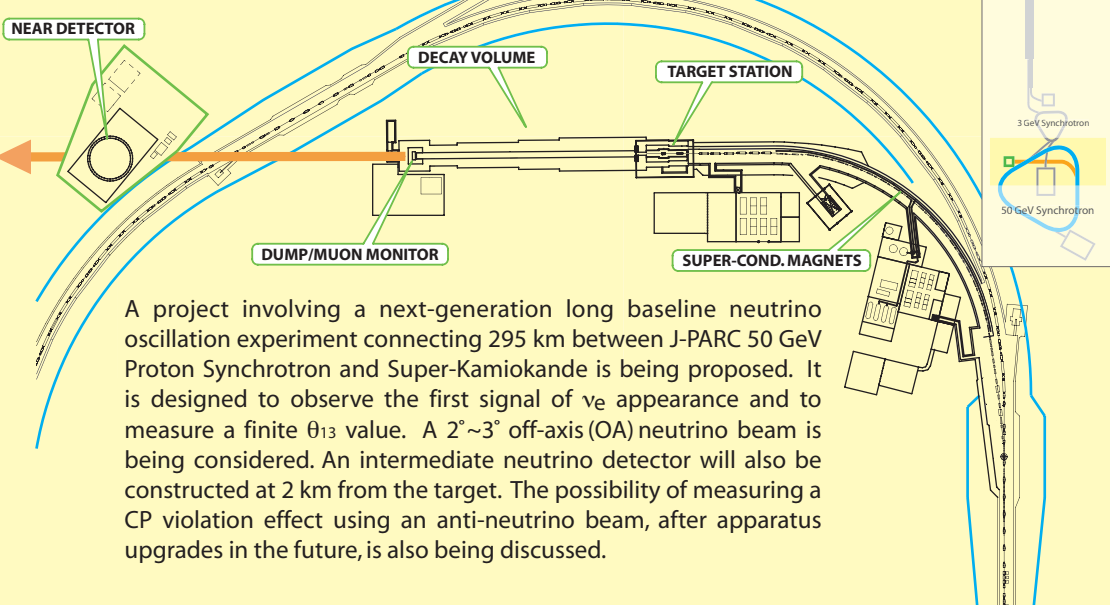
<http://www-nu.kek.jp/jhfnu/>



The sensitivities to $\sin^2 2\theta_{13}$ and Δm^2_{23} as a function of true Δm^2_{23} .



Expected 90% sensitivity contour on $(\Delta m^2_{13}, \sin^2 2\theta_{13})$ compared with the CHOOZ exclusion plot.



A project involving a next-generation long baseline neutrino oscillation experiment connecting 295 km between J-PARC 50 GeV Proton Synchrotron and Super-Kamiokande is being proposed. It is designed to observe the first signal of ν_e appearance and to measure a finite θ_{13} value. A $2^\circ \sim 3^\circ$ off-axis (OA) neutrino beam is being considered. An intermediate neutrino detector will also be constructed at 2 km from the target. The possibility of measuring a CP violation effect using an anti-neutrino beam, after apparatus upgrades in the future, is also being discussed.