

Physics Seminar

Friday, April 21, 2017 / 705 Pupin Hall / 11:00 AM

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"Latest results and future potential of Japanese long baseline neutrino oscillation experiments"

The T2K experiment is a long baseline neutrino oscillation experiment in Japan using the high intensity proton accelerator J-PARC as the neutrino beam source and Super-Kamiokande (SK) at 295 km from J-PARC as the far neutrino detector. T2K started data taking in 2010 and the accelerator is now running at 470 kW, accumulating $\sim 2.1 \times 10^{21}$ protons on target (POT). The latest results will be presented.

The next phase of T2K, "T2K-II", to increase the data to $\sim 20 \times 10^{21}$ POT with a J-PARC upgrade to 1.3 MW will be presented. T2K-II can find the first evidence of CP violation in the neutrino sector by more than 3 sigma if CP symmetry is maximally violated (CP delta = -90 deg) with the full statistics.

Hyper-Kamiokande (HK) is the next generation large water Cherenkov detector in Kamioka. We aim to begin construction in 2018 and completion by 2026 to start operation. The fiducial mass is 190 kt x 2 tanks (SK = 22.5 kt). With the HK detector and high intensity neutrino beam from 1.3 MW J-PARC, HK can find CP violation at >3 sigma for 80% region of the CP delta parameter space. Future potential of HyperKamiokande project will be presented.

