Contribution ID: **131** Type: **Oral**

Future of Super-Kamiokande and Hyper-Kamiokande

Thursday, 12 September 2013 16:00 (20 minutes)

Super-Kamiokande(SK) discovered neutrino oscillations of atmospheric neutrinos and solar neutrinos. Also, theta_13 was discovered by the T2K experiment. The future operation of SK will improve accuracy of oscillation parameter measurements. Especially, mass hierarchy in atmospheric neutrinos, spectrum upturn due to the solar matter effect in solar neutrino measurement, and the comparison of T2K theta_13 with reactor theta_13 measurements (which gives possible hints of non-maximal theta_23 and CP phase) are interesting subjects of the future SK. In addition, a program for low energy anti-neutrino physics, called GADZOOKS!, has been proposed and intensive R&D studies have been performed. By dissolving 0.1% gadolinium to SK, anti-electron-neutrinos can be detected by delayed gamma ray emission from neutron capture. GADZOOKS! will observe supernova relic neutrinos, and improve angular resolution for supernova burst neutrinos.
The finite theta_13 enables us to measure CP phase by comparing neutrino oscillations of nu_mu -> nu_e and anti_nu_mu -> anti_nu_e. For this purpose, a larger far detector volume is necessary. Hyper-Kamiokande(HK) will have 25 times larger fiducial volume size than SK. HK has a wide coverage for the CP phase measurement. Because of the large detector volume, HK has quite high sensitivities for mass hierarchy and theta_23 octant in atmospheric neutrinos, proton decay, and supernova neutrinos.
In this talk, future programs of SK and physics potential of HK are discussed.

Primary author: Prof. NAKAHATA, Masayuki (Kamioka observatory, ICRR, Univ. of Tokyo)

Presenter: Prof. NAKAHATA, Masayuki (Kamioka observatory, ICRR, Univ. of Tokyo)

Session Classification: Underground Laboratories/ Large Detectors II

Track Classification: Underground Laboratories/Large Detectors (incl. Nucleon Decay)