Contribution ID: **276** Type: **Recorded Presentation**

Development and tests of WLS plates for Outer Detector of Hyper-Kamiokande

A next generation underground water Cherenkov detector Hyper-Kamiokande will have a total mass of 237 kt of pure water. The inner detector has a cylindrical shape of 67 m in diameter and 69 m in height. This volume is viewed by inward-facing 50 cm PMTs. The outer segment is monitored by outward-facing 10000 PMTs, each embedded in a square Wavelength Shifting (WLS) plate of 30 cm side and 0.6 cm thickness to increase the collection of Cherenkov light. The Outer Detector (OD) acts mainly as a veto for entering particles.
In this talk, we present the results of the measurements of WLS plates manufactured by the V.A.Kargin Polymer Institute, Russia. WLS plates were doped with different WLS fluors. The test bench has a different configuration measurements in air and water, the optical readout was implemented with a Hamamatsu PMT R14374. UV LED light sources were used as an excitation source for each plate. LEDs with wavelengths of 265, 315, 380, and 405 nm covered the full Cherenkov light range of interest. The light yield and attenuation of signals for different WLS plates were measured in air and water. The effect of various WLS dopants and their concentrations was studied. Several reflectors were tested to increase the light yield of WLS plates. It was obtained that the usage of WLS plates in OD gives about a factor of 2 increase in the light signal from Cherenkov radiation compared with the OD configuration with bare PMTs without WLS plates.

Primary experiment

Hyper-Kamiokande

Primary authors: Dr KHOTJANTSEV, Alexei (Institute for Nuclear Research); KUDENKO, Yury (Russian Academy of Sciences (RU)); Dr YERSHOV, Nikolai (Insitute for Nuclear Research); Dr MINEEV, Oleg (Institute for Nuclear Research)

Presenter: KUDENKO, Yury (Russian Academy of Sciences (RU))

Track Classification: Cherenkov Detectors