Research Report
ICRR Inter-University Research Program 2020

Research Subject:

Light scattering measurement in the water using the Super-Kamiokande detector

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Summary of Research Result :

The laser calibration system consists of laser modules of 5 different laser wavelengths to measure the attenuation of the purified water inside the Super-Kamiokande detector. The hardware of laser calibration system of 473nm wavelength was broken in May. 2020 and we re-installed and tuned the intensity of the 473nm laser module. The intensity has been stabilized since Oct. 2020.

To calculate the light scattering probability of SK-V period, the Monte-Carlo for laser calibration system was used and compared with real-time data. Monte-Carlo samples were produced with a combination of three water transparency parameters (absorption, symmetric, asymmetric), we found the best fit parameter combination between Monte-Carlo and data. These values are important water parameters to be

used in the tuning of the Super-Kamiokande detector simulation.

- Water transparency of SK-V period

Wavelength [nm]	Transparency [m]
337	65.80
375	101.29
405	118.21
445	123.02
473	85.04

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