

Low-Energy Calibration of the Hyper-Kamiokande Detector Utilizing a Deuterium Tritium Neutron Generator

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Hyper-Kamiokande (HK) is a next-generation international neutrino experiment currently under construction in Japan. HK will explore proton decay and have the capability to detect Earth-crossing, atmospheric, solar, cosmic, and accelerator neutrinos. Expected to start data collection in 2027, HK will require periodic calibration for optimal performance.

The calibration at lower energies will involve utilizing a Deuterium Tritium neutron Generator (DTG), entailing the generation of a radioactive N16 cloud strategically positioned in various locations within the water tank.

A simulation of N16 cloud generation and decay was conducted, and the daughter particles were propagated through the detector volume using a dedicated HK simulation software. Energy and vertex reconstructions were performed using multiple reconstruction algorithms.

The DTG will be deployed using a computer-controlled crane to achieve accurate positioning while prioritizing the cleanliness and safety of the detector.

Alternate track

I read the instructions above

Yes

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