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Impact of external radiation on dark rate noise measurement for the Hyper-Kamiokande photomultiplier tube

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The Hyper-Kamiokande (HK) is a next-generation neutrino experiment built in Japan and scheduled to begin operation in 2027. A new PMT has been developed for the HK water Cherenkov detector with modifications in detection efficiency, timing resolution, and pressure tolerance by a factor of two with respect to those used in the Super-Kamiokande detector. The HK detector will be instrumented with 20,000 photomultiplier tubes (PMT). Currently, the PMTs are produced, and the performance testing of the delivered PMTs is underway in parallel. In this test, it was observed that the dark rate values differed depending on the measurement location. The difference is due to environmental radiation, which was confirmed by a test with a radiation source. This poster presents a correlation between the irradiation of gamma rays and dark noise rate and the evaluated intrinsic dark noise rate of HK PMT after subtracting the contribution due to environmental radiation.

Do you need a VISA letter for traveling to Canada ?

No

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