

Developing a high-granularity PMT array for future liquid xenon detector

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Photomultiplier tube (PMT) arrays are widely used for neutrino and dark matter detectors, such as liquid xenon (LXe) time projection chambers. We proposed using a new 2" four-anode PMT R12699-406-M4 from Hamamatsu for the future LXe detectors. The effective 1" active area is about an order of magnitude finer than the previously widely used 3" PMTs and offers better position reconstruction, which is essential for signal selection and background suppression. When arranged to have the same coverage percentage as a 3" PMT array, the high-granularity array has a wider effective dynamic energy range from keV to MeV. We constructed a test array of 36 PMTs (144 channels) to test the performance of the high-granularity PMT array.

Poster prize

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