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JUNO 20-inch Photomultiplier Tubes Testing and Performance

One of the crucial aspects to reach the aimed energy resolution of 3% @ 1 MeV in the JUNO experiment will be the performance of the 20-inch photomultiplier tubes (PMTs) used in the detector. Up to 20'000 of these PMTs will be deployed in JUNO, of which each of them moreover has to fulfil dedicated quality requirements for several key characteristics (such as low dark rate, sufficient PDE, peak-to-valley ratio etc.).

On this poster, we present the two independent PMT testing systems which have been developed to examine the 20-inch PMT performance – a PMT mass testing facility based on commercial shipping containers, capable to characterize all 20'000 PMTs individually, as well as a photocathode scanning system for uniformity and high resolution tests of at least a large subsample of PMTs – as well selected results from the PMT testing campaign running over the last three years.

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