

Signal optimization and study of the JUNO 20-inch PMT with high-voltage divider

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The Jiangmen Underground Neutrino Observatory (JUNO) is a 20 kton liquid scintillator detector with primary physics goal of neutrino mass hierarchy determination. One of the key parameters is that the energy resolution of the JUNO should reach 3%@1MeV, totally 20,000 20'' PMTs will be used, including 15000 MCP-PMTs from NNVT and 5000 dynode PMTs from Hamamatsu. For better performances and higher stability, the PMT will be optimized with high-voltage divider. In this work, we will show the design and study of the PMT high-voltage divider and the optimized signal about the overshoot and ringing following the positive HV scheme. We have controlled the overshoot to less than ~1% of the signal amplitude; especially, for MCP-PMTs, we have optimized the HV divider for the collection efficiency, and the time properties of the waveform. More other related parameters also will be presented.

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