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The Double Calorimetry System in JUNO

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The Jiangmen Underground Neutrino Observatory (JUNO) is located in Jiangmen, Guangdong, China, with an overburden of about 700 meters, and its installation is expected to be completed in 2023. The primary goal of the JUNO experiment is to determine the neutrino mass hierarchy with a significance of $3\text{--}4\sigma$ in 6 years of data taking and to precisely measure the mixing parameters.

An unprecedentedly high energy resolution of 3% at 1 MeV is required for this purpose. To achieve this, high optical coverage, large area PMT with high quantum efficiency, high transparency liquid scintillator (LS), and low backgrounds are needed. An independent double calorimetry system consisting of 17612 20-inch large PMTs (LPMTs) and 25600 3-inch small photomultiplier tubes (SPMTs) will provide a total photo-coverage of 78% and improving energy resolution, muon reconstruction, supernova neutrino detection. The performances of both types of PMTs reach the requirements. The photomultipliers are all in the process of being installed on the detector.

This talk will cover the current status of two independent systems, as well as the performance and electronics of both LPMT and SPMT.

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