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The 3-inch Photomultiplier System of the JUNO Experiment

The Jiangmen Underground Neutrino Observatory is a 20 kton liquid scintillator low radioactive multi-purpose detector under construction at 700 meter deep underground in China. Its physics goal includes determining the neutrino mass hierarchy and also measure the solar neutrino oscillation parameters with a sub-percent precision. The light produced in the liquid scintillator will be measured with 18,000 20-inch large photomultipliers, but also with 25,600 3-inch photomultipliers in the gaps between the large ones. This secondary system will operate in the photon-counting mode for energy below 10 MeV, providing a semi-independent measurement system to disentangle possible energy reconstruction systematics. The 3-inch photomultipliers will be connected to 200 electrical junction boxes deployed underwater. The boxes are able to power and readout 128 photomultipliers. A dedicated 128 channel readout front-end board based on the CATIROC ASIC chip has been developed and successfully prototyped.

Mini-abstract

A 25,600 3-inch photomultipliers system will operate as secondary light measurement system in JUNO.

Experiment/Collaboration

JUNO

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