

The Water Cherenkov Detector of JUNO

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The Jiangmen Underground Neutrino Observatory (JUNO) is a large-scale liquid scintillator detector constructed for neutrino detection. The detector will be situated in a laboratory ~700 meters underground to reduce the impact of cosmic muon-induced background. The central detector consists of a 20 kton liquid scintillator target enclosed within an acrylic sphere, surrounded by 17,612 20-inch large Photomultiplier Tubes (PMTs). Additionally, a 34 kton ultrapure water pool encompasses the central detector, with 2400 20-inch PMTs installed to function as a Water Cherenkov detector for cosmic muon detection and background reduction. A top tracker detector for muon tracking is positioned above the water pool. The inner surface of the water pool's wall and the outer surface of the stainless lattice steel are coated with Tyvek reflectors to enhance light collection efficiency. A water purification and circulation system maintains high water quality, ensuring optimal detector performance. Furthermore, a 32-coil system serves as a geomagnetic shield to protect the PMTs inside the detector from the influence of the geomagnetic field. The cosmic muon detection efficiency of the Water Cherenkov detector exceeds 99%, and the cosmic muon-induced fast neutron background can be controlled to ~0.1 per day. This poster will provide an overview of the design and current status of the Water Cherenkov detector of JUNO.

Institutional email

luhq@ihep.ac.cn

Poster prize

No

Given name

Haoqi

Surname

Lu

First affiliation

Institute of High Energy Physics, CAS, China

Second affiliation

Gender

Male

Collaboration (if any)

JUNO collaboration

Primary author: Mr LU, Haoqi (Institute of High Energy Physics, CAS, China)

Presenter: Mr LU, Haoqi (Institute of High Energy Physics, CAS, China)

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