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The Water Cherenkov Detector of JUNO

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The Jiangmen Underground Neutrino Observatory (JUNO) is a large liquid scintillator detector being built for neutrino detection. The detector will be built in a laboratory at 700-m underground for cosmic muon-induced background reduction. The 20 kton of liquid scintillator target is in an acrylic sphere surrounded by 17612 20-inch large PMTs that compose the central detector. A 34 kton ultrapure water pool surrounds the central detector, and 2400 20-inch PMT is installed as a Water Cherenkov detector for cosmic muon detection and background reduction. On top of the water pool was a top tracker detector for muon tracking for Li9/He8 background study. The water pool's wall inner surface and the stainless steel's outer surface are covered with Tyvek reflectors to increase light collection efficiency. A water system is used for water purification and circulation to maintain high water quality for better detector performance. A set of radon removal equipment will be integrated with the water system to reduce the radon-induced background in water, with anticipation of radon concentration in water reduced to 10mBq/m^3.The main goal of JUNO is for neutrino mass ordering determination; it is also a multi-purpose experiment, such as supernova neutrino, atmospheric neutrino, solar neutrino, and nuclear decay, being also detected in addition to reactor neutrino detection. The cosmic muon detection efficiency of the water Cherenkov detector is >99%, and the cosmic muon-induced fast neutron background can also be controlled to ~0.1/day level. This presentation will cover the design and status of the Water Cherenkov detector of JUNO.

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

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

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