

The JUNO VETO detector system

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Content

The Jiangmen Underground Neutrino Observatory (JUNO) is a 20 kton liquid scintillator detector with primary physics goal the neutrino mass hierarchy determination. The detector will be built in 700m deep underground laboratory. A multi-veto system will be built for cosmic muon detection and background reduction. The outer of the central detector is filled with water and equipped with ≈ 2000 MCP-PMTs (20 inches) to form a water Cherenkov detector for muon tagging. Both the water Cherenkov detector walls and the central detector external surface are coated with Tyvek reflector to increase the light collection efficiency. A Top Tracker (TT) detector will be built by re-using the Target Tracker of the OPERA experiment. The TT consists of 62 walls made of plastic scintillator strips equipped with WLS fibers with dimension 6.8m*6.8m each, and allows x-y readout for precise muon tracking. The three layers of the TT with the appropriate trigger electronics will help to understand the cosmogenic background contribution and reduction as the one induced by the isotopes ^9Li and ^8He .. It will cover half of the top area with three layers spaced by one meter. The muon detection efficiency is $>95\%$ for water Cherenkov detector. With this veto system, the cosmic muon induced fast neutron background can be reduced at the level of $\approx 0.1/\text{day}$.

Summary

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