

Neutrino physics at JUNO experiment

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Abstract

The Jiangmen Underground Neutrino Observatory (JUNO) is a multipurpose neutrino experiment currently being built in Kaiping, Jiangmen, Guangdong, China. The primary physics goal of JUNO is to determine neutrino mass ordering and measure precisely neutrino oscillation parameters θ_{12} , Δm_{21}^2 , $\Delta m_{31\text{or}32}^2$ with sub-percent accuracy by detecting reactor neutrinos. Beyond the detection of reactor neutrinos, JUNO is capable to observe also supernova neutrinos, solar neutrinos, atmospheric neutrinos, geo-neutrinos and search for proton decay, etc. It will provide a unique opportunity to address some unsolved crucial questions in particle physics and astrophysics. JUNO is going to be the world's largest ever liquid scintillator detector filled with 20,000 ton target mass, viewed by 2 photon detection systems (18,000 20-inch photo-multiplier tubes and 25,000 3-inch photo-multiplier tubes), in order to achieve the unprecedented 3% energy resolution at 1MeV and 1% energy scale calibration uncertainty. In this poster, both the physics potential of JUNO and the design of JUNO detector will be shown.