

Overview of the JUNO-TAO Experiment

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The Taishan Antineutrino Observatory (TAO, also known as JUNO-TAO) is a satellite experiment of the Jiangmen Underground Neutrino Observatory (JUNO). The experiment consists of a ton-level liquid scintillator detector placed at 44 m from a 4.6 GWth reactor core of the Taishan Nuclear Power Plant. The main goal is to measure the reactor antineutrino spectrum with sub-percent energy resolution, providing a reference spectrum for JUNO as well as a benchmark for nuclear databases and other experiments. The detector design consists of a spherical acrylic vessel containing 2.8 ton gadolinium-doped liquid scintillator viewed by 10 m^2 Silicon Photomultipliers (SiPMs) with $\sim 50\%$ photon detection efficiency and providing around 95% photon coverage. The expected energy resolution is better than 2% at 1 MeV. The detector will operate at -50°C to mitigate the impact of SiPM dark noise. About 1000 reactor antineutrinos will be collected per day. The detector is under construction and a prototype detector has been assembled and tested. The detector operation is expected to begin as soon as 2024.

Poster prize

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