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Research and Design of the Jinping Neutrino Experiment

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Jinping Underground Laboratory has the advantage of the world's largest vertical rock overburden and the farthest distance to commercial nuclear power plants. The suppression of cosmic-ray muon-induced backgrounds and the neutrinos from the reactor can significantly improve the measurement accuracy of solar and geo neutrinos in the MeV energy region. The 0.5 to 15 MeV interval is an important exploration area for solar neutrino experiments, where the accuracy of pep neutrinos, low-energy B8 neutrinos, and CNO neutrinos can be improved for the study of solar neutrino oscillations, especially the transition behavior of oscillations from vacuum to matter, i.e., the matter effect, excluding assumptions of new physics. These measurements can also be used to determine the metallicity of the Sun. It is also convenient to measure the geoneutrino flux at Jinping, investigating the radiogenic heat contribution of the Himalayas and the content of U and Th radionuclides in the Earth. A hundred-ton scale experiment is planned and is going to be constructed in the second phase of Jinping underground laboratory. In this talk, I will present the progress of the hundred-ton detector.

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