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JUNO's Prospect for atmospheric neutrinos

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The Jiangmen Underground Neutrino Observatory (JUNO) is a next-generation neutrino detector under construction in Guangdong, China. With a 20-kt target, JUNO will be the largest liquid scintillator (LS) detector ever built. JUNO's instrumental setup includes nearly 18,000 20-inch photomultiplier tubes, providing an extensive 78% optical coverage.

The primary objective of JUNO is to determine the neutrino mass ordering (NMO) by studying the vacuum-dominated oscillation pattern of reactor antineutrinos. However, JUNO's physics potential extends beyond reactor neutrinos thanks to its unique design. JUNO will be able to probe atmospheric neutrinos at lower energies than the current large water/ice Cherenkov detectors. This talk will provide current updates on various aspects of atmospheric neutrino research at JUNO, including a preliminary sensitivity study to NMO, energy and directionality reconstruction, neutrino interaction models in LS, and a primary neutrino energy spectrum based on a probabilistic unfolding method.

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