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Physics potential of solar neutrino detection with JUNO

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The JUNO detector (Jiangmen Underground Neutrino Observatory), located in Jiangmen, southern China, is currently in its commissioning phase. Its main goal is to determine the neutrino mass ordering and to reduce uncertainties on oscillation parameters. Thanks to its huge liquid scintillator mass (20 kton), its high radiopurity and excellent energy resolution, JUNO is an ideal candidate to detect solar neutrinos.
JUNO solar neutrino program covers both the high energy region (
$gtrsim3$ MeV) of the spectrum, dominated by ^{8}B neutrinos, and the intermediate energy region (between 0.5 and 1.5 MeV), dominated by *pep*, CNO and ^{7}Be neutrinos.

^{8}B neutrinos, due to their high energy, can be detected via the charged currents, neutral current and elastic scattering channels, that allow model-independent flux measurements. At the same time ^{8}B neutrino measurements can provide $\sin\theta_{12}$ and Δm^2_{12} measures independently from the values calculated with reactor neutrino analysis. Possible discrepancies between the values could be an indication of non-standard interactions.

The intermediate energy region will instead be more strongly influenced by the contamination levels. However, even assuming the minimal radiopurity, JUNO will be able to improve current measurements of ^{7}Be neutrino fluxes, thereby placing more stringent constraints on current solar models.

This contribution will focus on JUNO sensitivity to solar neutrinos, highlighting the potential impact of these measurements both on the refinement of the Standard Solar Model and on the advancement of neutrino physics, particularly in probing oscillation parameters and exploring possible new physics scenarios.

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