

Enhancing Solar Neutrino Sensitivity with Neutron Tagging

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Solar neutrinos provide crucial insights into the Sun's fusion processes and neutrino oscillations in matter. However, detecting them requires effective suppression of backgrounds. One of these is spallation backgrounds—beta decays of unstable isotopes produced by cosmic-ray muons—which pose a major challenge above 6 MeV. We show that neutron tagging, made possible by the recent addition of dissolved gadolinium, provides a powerful new method to identify and reject these backgrounds. This technique is particularly relevant for future shallower detectors like Hyper-Kamiokande and JUNO.

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