

DUNE as the Next-Generation Solar Neutrino Experiment

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We show that the Deep Underground Neutrino Experiment (DUNE) has the potential to deliver world-leading results in solar neutrinos. With an exposure of 100 kton-year, DUNE could detect 10^5 signal events above 5 MeV electron energy. Separate precision measurements of neutrino-mixing parameters and the 8B flux could be made using two detection channels and the day-night effect. New particle physics may be revealed through the comparison of solar neutrinos (with matter effects) and reactor neutrinos (without), which is discrepant by $\sim 2\sigma$ (and could become 5.6σ). New astrophysics may be revealed through the most precise measurement of the 8B flux (to 2.5%) and the first detection of the hep flux (to 11%). DUNE is required: No other experiment, even proposed, has been shown capable of fully realizing these discovery opportunities.

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