

Abstract Submitted
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Search for Sterile Neutrinos at the SNS: OscSNS WILLIAM LOUIS, LANL, OSCSNS COLLABORATION — The SNS is coming online over the next few years and will be a prodigious source of neutrinos from π^+ and μ^+ decay at rest, which can be used for high-precision neutrino oscillation experiments. The neutrino flux from the SNS is known extremely well and includes $\bar{\nu}_\mu$ and ν_e from μ^+ decay at rest, as well as the 30 MeV monoenergetic ν_μ from π^+ decay at rest that can be used to search for the existence of sterile neutrinos via the neutral-current reaction $\nu_\mu C \rightarrow \nu_\mu C^*$ (15.11). An oscillation or suppression of this reaction would be direct evidence for sterile neutrinos. The OscSNS detector is based on the LSND and MiniBooNE detectors and can achieve the world's best neutrino oscillation sensitivities for $\bar{\nu}_\mu \rightarrow \bar{\nu}_e$ oscillations, $\nu_\mu \rightarrow \nu_e$ oscillations, and $\nu_\mu \rightarrow \nu_x$ oscillations at a Δm^2 scale of $\sim 0.1 - 1 \text{ eV}^2$. In addition, OscSNS can make precision measurements of $\nu_\mu e \rightarrow \nu_\mu e$ elastic scattering, $\nu_e e \rightarrow \nu_e e$ elastic scattering, and $\nu_e C \rightarrow e^- N$ charged-current scattering.

William Louis
LANL

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