Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Searching for Sterile Neutrinos at J-PARC with JSNS^2 JOHNATHON JORDAN, University of Michigan, JSNS^2 COLLABORATION — The J-PARC Sterile Neutrino Search at the J-PARC Spallation Neutron Source (JSNS^2) will look for neutrino oscillations with a characteristic frequency of $\Delta m^2 \sim 1$ eV^2 . The experiment will be constructed at the J-PARC Material and Life Science Experimental Facility (MLF) and will perform a search for $\bar{\nu}_\mu \to \bar{\nu}_e$ oscillations over a 24 m baseline using muon decay at rest neutrinos originating from 3 GeV proton interactions with a mercury target. Using two tanks of Gd-doped liquid scintillator with a total fiducial volume of 50 tons, JSNS^2 will exploit the unique signature of inverse beta decay (prompt positron signal, delayed gammas from neutron capture) to look for $\bar{\nu}_e$ appearance. Additionally, JSNS^2 will enable novel cross section measurements using 236 MeV muon neutrinos from charged kaon decay at rest (KDAR).

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Date submitted: 28 Sep 2016 Electronic form version 1.4