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Status and Prospects of the JSNS^2 experiment

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The JSNS^2 experiment aims to search for the existence of neutrino oscillations with Δm^2 near 1 eV^2 at the J-PARC Materials and Life Science Experimental Facility. A 1 MW proton beam (3 GeV) incident on a mercury target produces an intense neutrino beam from muon decay at rest ($\mu^+ \rightarrow e^+ + \bar{\nu}_\mu + \nu_e$). The oscillation to be searched for is $n\bar{u}_\mu$ to $\bar{\nu}_e$, detected via the inverse beta decay reaction ($\bar{\nu}_e + p \rightarrow e^+ + n$), which is then distinctively tagged by gammas from neutron capture of Gadolinium. The first of two detectors with 17 tons fiducial volume is currently under construction at a distance of 24 m from the mercury target. JSNS^2 is expected to provide the ultimate test of the LSND anomaly by replicating nearly identical conditions. The status of the experiment, which is expected to start by the end of this year, will be discussed and its physics potential reviewed.

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