

The Preparation Status and Plan for the Next Physics Run of the NINJA Experiment

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The NINJA experiment aims to precisely measure neutrino interactions using a nuclear emulsion detector to reduce systematic errors in the neutrino oscillation experiments including T2K experiment, and search for sterile neutrinos. The nuclear emulsion, with its sub-micron positional resolution, allows for detecting low-momentum charged particles such as protons with a threshold of 200 MeV/c. In the NINJA experiment, a muon detector placed downstream of the emulsion detector is used to identify muons from ν_μ CC interactions. While the nuclear emulsion offers an excellent positional resolution, it lacks timing information, and most of the tracks accumulated in the nuclear emulsion are from cosmic rays. Consequently, the positional resolution of the muon detector is not enough to match the muon tracks to the emulsion detector. To address this, a scintillation tracker is used to provide both timing and positional information for the tracks.

The NINJA experiment is planning a third physics run with about 130 kg water target in 2025. Since the target mass is larger than previous runs, a larger scintillation tracker covering 1.3 m \times 1.3 m is needed. We are developing a newly designed scintillation tracker, consisting of a monolithic plastic scintillator plane including scatterers. In this presentation, we will show the preparation status and plan for the next physics run, focusing particularly on the development of the new scintillation tracker.

Working Group

WG 6: Detectors

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